Saroj Pachauri
Ash Pachauri *Editors*

Health Dimensions of COVID-19 in India and Beyond

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Editor Funded

Foreword

The COVID-19 pandemic is undoubtedly the greatest challenge in peacetime facing the world for a century. No country is untouched with more than 3.2 million deaths and over 155 million cases at the time of writing, and the actual numbers are probably much higher. One year into the crisis, the sobering reality is that we are only at the beginning of the pandemic, with some countries provisionally suppressing outbreaks and others experiencing resurging epidemics with tragic consequences. In addition to the direct health impacts, the widespread social and economic devastation will be with us for years to come. While we continue to deal with the acute stage of the pandemic, we must now take a long-term view and shift our thinking to societies living with COVID-19.

A rare silver lining in the crisis is that unprecedented scientific collaboration and transparency have delivered in months what would normally take decades with the development of safe and effective vaccines, diagnostics, and to a lesser extent therapeutics. The power of Indian science, and its world-class vaccine industry, has been at the forefront of this endeavor to the benefit of India and the world. The top priority today is to ensure everyone, everywhere has equitable access to these tools. Now more than ever, we must rely on science and innovation to chart a path forward and save lives.

I, therefore, welcome this important and thought-provoking book, *Health Dimensions of COVID-19 in India and Beyond*, which could not come at a more critical time. The COVID-19 situation in India is very serious and concerning. There is an urgent need for evidence and real-world experience to inform the response in India and globally that this edited volume delivers. It brings together authoritative voices to discuss some of the most pressing issues the world faces in pandemic preparedness and response—from the importance of investing in resilient and responsive health systems, leveraging technology and innovation, to science-informed communication and behavior change strategies, and the clinical aspects of SARS-CoV-2.

While addressing many essential elements of the COVID-19 response in India and other countries such as South Korea, Taiwan, Singapore, Vietnam, and East Timor, the chapters also importantly address a range of other health issues. Indeed, we do not yet fully understand the full impact of the virus and the response on a range of

other human health issues such as tuberculosis, sexual and reproductive health and family planning, malnutrition, and other comorbidities as described in the book.

Crucially, this book puts people at the center with a strong focus on community action and empowerment throughout. The pandemic has exposed and exacerbated deep-rooted inequalities within and between countries, and the crucial analysis around self-care among vulnerable populations in India shines through in the chapters, as does the intrinsic importance of gender equality.

The COVID-19 pandemic will not be over anywhere, until it is over everywhere. The crisis has shown on an unprecedented scale that we are only as strong as our weakest link when it comes to epidemics. Lessons must be learnt not only to deal with COVID-19 but to prepare for the ever-present risk of another health threat, which many have warned may be worse. We must act now in solidarity to control the pandemic, relying on sound evidence and intelligence as documented throughout these pages, and ensuring that the benefits of science reach people, everywhere.

London, UK   Dr. Peter Piot
                                                        Director of the London School of
                                                        Hygiene and Tropical Medicine

Preface

The COVID-19 pandemic that is raging through the world has disrupted peoples' lives and livelihoods. The year 2020 has been like no other as it witnessed the ravaging impact of the pandemic on society. COVID-19 is hitting the headlines every day as large numbers of people get infected and many die. What is most frustrating is that we still know very little about the virus or the epidemiology and the pathogenesis of the disease that it causes. On the other hand, within a short period of a year, scientists and public health professionals have made major strides in learning about the disease and how it can be prevented. Vaccines have been developed at lightning speed, and many are being rolled out. Serious efforts are underway to prevent this deadly disease that is tearing the fabric of society globally.

This is the first book that examines multiple health dimensions of COVID-19 in India. It has brought together a group of top scholars to discuss a range of issues relating to COVID-19. These include its impact on health service delivery, use of technology such as tele-medicine and other virtual methods for providing health services and training healthcare workers, critical care in hospitals, comorbidities such as tuberculosis, self-care, gender dimensions of the problem, its impact on mental health, sexual and reproductive health, hunger and nutrition, and health financing. Vaccine development and distribution and the changing role of media and communications are discussed. Lessons are drawn from countries in Asia that have been successful in containing the pandemic.

The contributors of this edited volume are leaders in their fields. They have presented the latest research and have discussed the causes and consequences of and solutions for several problems that relate to COVID-19. While the book focuses on India, the situation of the pandemic in other countries is also illuminated. This book was written during a time when we were all in isolation with limited mobility because of the pandemic. It was not, therefore, possible to personally interact with the authors of the chapters or with colleagues who assisted in the writing of the book.

While this presented a challenge, it also provided an opportunity to complete this work in record time.

New Delhi, India   Saroj Pachauri
                                                                                               Ash Pachauri

Acknowledgements

Contents

Editors and Contributors

About the Editors

Saroj Pachauri a Public Health Physician has undertaken extensive research on sexual and reproductive health and rights, HIV and AIDS, family planning, maternal health, gender, poverty and youth. Saroj Pachauri was Regional Director for South and East Asia, Population Council. She has published 4 books, contributed chapters to 20 books, published over 100 papers in peer-reviewed journals and numerous print and media articles. She was awarded the Grants Gold Medal for securing the first position in DPH and was bestowed the prestigious title of Distinguished Scholar by the Population Council.

Ash Pachauri a Ph.D. in Behavioral Science and a Public Health Expert, is a Self-Care Guideline Development Group Member of the World Health Organization, Geneva. He was awarded the exclusive Overseas Research Scholarship by the Secretary of State for Education and Science, UK; awarded a full scholarship for a Ford Foundation-funded Sexual Health Education Program by San Francisco State University; and honored with the "Portraits of Commitment" leadership title by the United Nations. He has contributed to 5 books and authored over 55 conference papers and publications.

Contributors

Mr. Kaushik Bose is Vice President of the Global Health Strategies (GHS), India office. Prior to working with GHS, he managed the communications and advocacy efforts of multiple projects at PATH India where he worked extensively on immunization and rotavirus projects. His rural campaign on maternal and neonatal health at PATH won multiple awards from the Rural Marketing Association of India.

He has over 18 years of experience in strategic brand-building through advertising, media relations, internal communications, and external communications. He has been associated with large corporate houses in the past when he managed their corporate communications, brand communications, and sustainability initiatives. He worked with the International AIDS Vaccine Initiative during the preparatory phase of clinical studies on the AIDS vaccine in India. He previously worked for several international brands like Coca-Cola, Philips, Merck Sharp and Dohme, Aventis Pasteur, Pfizer India Ltd, Becton Dickinson, and Reckitt Benckiser. He has a master's degree in business administration.

Ms. Dipa Nag Chowdhary is Director Programs at Population Foundation of India where she leads the organization's program on sexual and reproductive health. She is an international development professional with more than 20 years of experience in India, South Asia, and at the global level. Her sectors of work are gender, youth, sexual and reproductive health and rights, maternal health, governance and accountability, HIV/AIDS, and secondary education. Her competencies are strategic planning, program development and management, policy advocacy, research, monitoring and evaluation, and capacity building. From 1998 to April 2019, she worked at the India office of the John D. and Catherine T. MacArthur Foundation. In her role as Deputy Director, she led the Foundation's grant-making on maternal health, promoting young people's sexual and reproductive health, and girls' secondary education. Prior to joining the MacArthur Foundation, she worked on issues related to HIV/AIDS at the Naz Foundation (India) Trust in Delhi and at the Mailman School of Public Health at the Columbia University in New York, USA. She was also employed by the International Food Policy Research Institute in Washington DC to undertake research on nutrition. She has a master's degree in public administration from the Syracuse University in the USA and in political science from the Mumbai University.

Ms. Priti Dave has worked in global public health for over 30 years. She is currently working as a consultant to Options Consultancy Services under the Women's Integrated Sexual Health (WISH2ACTION) program, funded by UK aid. Prior to that, she was Director of Strategy at Options Consultancy Services. She worked at the Children's Investment Fund Foundation (CIFF) and the Ford Foundation, and as Team Leader of the UK government's health systems strengthening program in Madhya Pradesh, India. Her areas of expertise include maternal, newborn, child and adolescent health, family planning, HIV/AIDS, and nutrition. She supports the rollout of Universal Health Coverage through policy advocacy, health systems strengthening, and impact evaluation.

Ms. Sebastiana A. Etzo pursues her interests in health governance and health system strengthening. Prior to Options, she worked in different roles focusing on women's health and rights and transparency and accountability in the health sector. Before moving to the international development sector, she conducted extensive research on urban governance, public sector reforms, and social movements in Sub-Saharan Africa.

Mr. Gopi Gopalakrishnan has over three decades of experience in implementing large-scale service delivery programs in low-resource settings. He has founded two large organizations—World Health Partners which focuses on delivering primary health care to rural communities by innovatively harnessing existing resources in the poorest states of India and Kenya, and *Janani* which delivers reproductive health services in Bihar and Jharkhand, two of the poorest states of India. His work relates to operationalizing public–private partnerships in which private sector resources are tailored to complement public sector service provision. Increasingly, his recent work has devoted attention to integrating stronger management systems and technologies within public sector programming.

He has been Member of India's Population Commission. He has advised the Ministry of Health and Family Welfare and numerous national and international organizations on large-scale cost-effective service delivery. He has served on the Global Technical Advisory Board of the International Finance Corporation, an affiliate of the World Bank. He is currently Member of the Advisory Group on Community Action (AGCA) of the National Health Mission.

During his career, he also worked as Director of International Programs of DKT International based in Washington DC and as Country Director of DKT Vietnam based in Hanoi. He has been awarded by the Skoll Foundation, the Schwab (World Economic Forum) Foundation, and Ashoka Foundation for social entrepreneurship, and is the recipient of a prestigious civilian honor from the Government of Vietnam. He has been trained through executive and leadership programs at Harvard, UC Berkeley, and Johns Hopkins University at various parts of his career.

Dr. Indrani Gupta is Professor and Head of the Health Policy Research Unit of the Institute of Economic Growth (IEG), Delhi, India. She received her Ph.D. in economics from the University of Maryland, USA. She set up a center for health economics and policy research in her institute, the first of its kind in India.

Her diverse work experience includes teaching and academics with the World Bank and the Government of India. Her interest covers a wide range of topics in the areas of health economics and policy and includes demand for health care, health financing, healthcare coverage, poverty, health, costing, cost-effectiveness, and economics of diseases.

Ms. Mandira Kalra Kalaan is Social Anthropologist by training and has 17 years of experience working in the fields of gender, rights, and communication. She has been involved with both creating and implementing social and behavior change communication programs, digital communications, and interpersonal communications on gender, health, and development.

Ms. Sapna Kedia works as Technical Specialist at the International Center for Research on Women (ICRW), Asia. She is Co-founder of the Women in Global Health, India Chapter, which seeks to achieve gender equality in global health leadership, with a specific focus on India. At ICRW, her work focuses on conducting research, designing, and implementing programs on sexual and reproductive health and rights for girls and women, how gender norms impact men and masculinities,

and gender in public policy and governance. She recently led ICRW's study on Male Involvement in Pre-marital Abortions in New Delhi. She leads the implementation of the 3D Program for Women and Girls in India which aims to advance gender equality for girls and women by facilitating convergent action across the government, civil society, and the private sector. She also supports the Gender Equity Movement in Schools (GEMS) for Boys program in Rajasthan.

Prior to joining ICRW, she worked as Qualitative Researcher at OneWorld South Asia and studied innovative approaches to the improvement of public service delivery, as well as the promotion of social inclusion in India. She worked as a trainer on child sexual abuse with the Recovering and Healing from Incest (RAHI) Foundation and consulted with the World Bank on its social inclusion and governance projects.

Dr. Shweta Khandelwal is Head, Nutrition Research at the Public Health Foundation of India (PHFI), Delhi. As a trained and experienced public health nutrition researcher, she has worked in the maternal and child health and nutrition space in India for the last 15 years. She teaches nutrition epidemiology especially in relation to rising overweight–obesity and diet-related non-communicable diseases. She has experience in studying local food environments and examining how they are associated with various forms of malnutrition. She serves on expert panels constituted by the Food Safety and Standards Authority of India (FSSAI) and the Ministry of Health and Family Welfare, Government of India, and on non-communicable diseases (NCDs), oils and fats, sustainable healthy diets, as well as on combating high fat, sugar, and salt in the diets of the Indian population. She has a passion for teaching while also pursuing research activities. She has been instrumental in starting a capacity building initiative in public health and nutrition (PHN) and nutrition epidemiology. She strongly believes that studying/pursuing work in nutrition should not be interpreted merely as therapeutic responses to health problems, but this field should inculcate more public health understanding supplemented with better training in research methods. At PHFI, she has been Founder Member and Leader (as faculty in-charge and course coordinator) of the online PHN course from its inception (2011–2014). This program is quite popular and ranks high among government officials, international participants, and UN institutions engaged in nutrition at program and policy levels. She is Visiting Faculty for PHN at the Sir Vithaldas Thackeray (SVT) College in Mumbai. She is Invited Member, Board of Studies, for both Shreemati Nathibai Damodar Thackersey (SNDT) Women's University and the Shree Guru Gobind Singh Tercentenary (SGT) University. For the past five years, she has served as Course Director for Continuous Change Detection Classification (CCDC's) annual series of 5-day seminars on nutrition methods.

She has reviewed 65 peer-reviewed articles in scholarly journals and has contributed to more than 150 stories in international and national print and online media. She has won several prestigious fellowships, awards, and recognition in the area of PHN including the Department of Science and Technology's Young Scientist Award, World Heart Federation's Emerging Leader Award, All India Institute of Medical Sciences for significant contribution to the nutrition field, and Amity University's Best Faculty in Public Health and Nutrition Award.

Mr. Philip Neil Kumar is a social development professional with 25 years of experience in social impact projects. His areas of work include HIV/AIDS, tuberculosis, kala-azar, and water and sanitation. He has engaged with a variety of programs including those of The Bill and Melinda Gates Foundation (BMGF) and the Public Health Foundation of India (PHFI). He is Fellow of the Royal Society of Health (FRSH). He has been Consultant to WHO, UNAIDS, The Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM), and the World Bank on assignments spanning across India and other countries in Asia-Pacific.

Dr. Lisa Lazarus is Research Associate at the Institute for Global Public Health, University of Manitoba, where she recently completed a Ph.D. in community health sciences. She is Community-based Researcher. Her work centers on community-led HIV prevention and treatment interventions. For over ten years, she has been collaborating on research projects with *Ashodaya Samithi*, a sex worker-led organization based in Mysore, South India.

Dr. Robert Lorway is Associate Professor at the Institute for Global Public Health, University of Manitoba. He currently holds the Canadian Research Chair in Global Intervention Politics and Social Transformations. He received a Canadian Institutes of Health Research New Investigator Award for HIV services/population health research. As a sociocultural medical anthropologist, his research is focused on the social study of global interventions designed to improve the lives of marginalized populations. His theoretical engagements are rooted in applied public health projects conducted in close collaboration with marginalized groups in different countries of Africa and Asia including India.

Ms. A. Philo Magdalene is currently pursuing her master's in literary and cultural studies from the English and Foreign Languages University, Hyderabad. She has an undergraduate degree in English from the Women's Christian College, Chennai; she has undertaken undergraduate studies on second-language learning and teaching.

Recipient of the AIDS 2020 Scholarship, she was selected to be the AIDS 2020 Virtual Youth Ambassador from India. She is Communications and Research Assistant at the Center for Human Progress (CHP), an organization that promotes health and human rights. She assisted in the development process of the WHO Consolidated Guideline on Self-care Interventions for Sexual and Reproductive Health. She undertook community-based research to capture the intersectional vulnerabilities of high-risk populations in India. Through CHP and in collaboration with UNAIDS and WHO, she has contributed to the country's effort in and progress toward achieving Universal Health Coverage. She is also Youth Mentor at the Protect Our Planet (POP) Movement, an organization that promotes youth-led climate action through knowledge and mentorship. She supported the implementation and documentation of the Second World Sustainable Development Forum in Durango, Mexico.

Dr. Purnima Mane is an internationally recognized expert on gender, population and development, and public health, and has devoted her career to advocating for population and development issues and working on sexual and reproductive health. She is Member of the Group of Women Leaders–Voices for Change and Inclusion.

Most recently, she was President and CEO of Pathfinder International, prior to which she was Deputy Executive Director (Program) of the United Nations Population Fund (UNFPA) and UN Assistant Secretary General. She has served in senior-level positions in international organizations such as UNAIDS, World Health Organization, the Global Fund to Fight AIDS, Tuberculosis and Malaria, and the Population Council. She worked for over a decade and a half in India on gender and health-related issues while serving as Associate Professor at the Tata Institute of Social Sciences (TISS) in Mumbai.

She is Board Member of the International Development Research Centre, Canada, the International AIDS Vaccine Initiative, the MTV Staying Alive Foundation, and Hesperian Health Guides. She is also Member of the Leadership Council of Rise Up, the Advisory Council of Center of Expertise on Women's Health, Gender and Empowerment, University of California, and Global Health Institute, and is Ex-Officio Board Member of the Bay Area Global Health Alliance. She holds a doctoral degree in women's studies from TISS. She has been a recipient of the Fulbright Postdoctoral Fellowship (1991–1992) and the Rockefeller Foundation Bellagio Fellowship (2016), and was Visiting Fellow at the University of New South Wales, Australia (2017–2019). She has co-authored several papers and co-edited a number of books. She is Founding Editor of the journal, Culture, Health and Sexuality.

Mr. Chapal Mehra is a writer, public health specialist, researcher, and advocate on issues of health, development, and human rights. He has been working with survivors, civil society, and experts to provide greater visibility to health issues and to engage them on issues of program and policy formulation. His work in health focuses particularly on TB, mental health, and HIV. He writes regularly for numerous publications. His earlier books include TB: 'India's Ticking Time Bomb' and 'Voices from TB.'

Ms. Komal Mittal wears two professional hats as she plays the role of Research Associate in health at the Center for Human Progress and is Global Youth Mentor of the Protect Our Planet (POP) Movement. She conducted research on understanding self-care practices of the most marginalized and vulnerable communities in India. She led a national youth group supported by the Joint United Nations Programme on HIV/AIDS (UNAIDS). This program focused on promoting leadership and advocacy for the Sustainable Development Goals.

She has attended several conferences, including some internationally, and has presented many reports on public health issues. She was awarded the 'Research Excellence Award' in the field of biotechnology for her study on 'Extraction of Acid Soluble Collagen from Soybean and Tomato.' She recently co-authored a book entitled 'Sexual and Reproductive Health and Rights: Self-care for Achieving Universal Health Coverage.'

Ms. Poonam Muttreja is Executive Director of the Population Foundation of India (PFI) and has for over 40 years been a strong advocate for women's health, reproductive and sexual rights, and rural livelihoods. She has co-conceived the popular transmedia initiative, *Main Kuch Bhi Kar Sakti Hoon—I* (A Woman, Can Achieve

Anything). Before joining PFI, she served as the India Country Director of the John D. and Catherine T. MacArthur Foundation for 15 years. She co-founded and led the Ashoka Foundation, Dastkar, and the Society for Rural, Urban and Tribal Initiative (SRUTI). An alumna of Delhi University and Harvard University's John F. Kennedy School of Government, she serves on the governing council of several nongovernmental organizations. She is a regular commentator in India and globally for television and the print media.

Ms. Madhu Bala Nath started her career in the early eighties as a Women in Development Officer with the Swedish International Development Authority (SIDA) in India. She moved on to working at the policy level with the United Nations Development Fund for Women (UNIFEM) as its Regional Director for India and Indo-China. In 1994, she started work on HIV/AIDS with UNDP and later with UNAIDS as its Regional Policy Advisor. In the new millennium, she worked with UN Women in South Asia as its Regional Policy Advisor on issues of violence against women, gender responsive governance, women, peace and security, economic empowerment, and gender responsive planning and budgeting. She also served as Regional Director for South Asia for the International Planned Parenthood Federation and as Country Director for EngenderHealth.

She has authored three books entitled *….and then she stirred*, *From Tragedy Towards Hope*, and *May I Have Your Attention Please?* She has developed two capacity building tools, namely a training manual on 'Gender, HIV/AIDS and Human Rights' and a resource guide on 'How to Empower Women to Negotiate Safe Sex.'

She is currently serving on the board of directors of four organizations, namely Havells Electronic Private Limited (HPL) Power, Charities Aid Foundation, HIV/AIDS Alliance India, and Population Services International. She is on the advisory committee of '*Roshni*,' a project being implemented by Lady Irwin College, University of Delhi.

Mr. Omar Ahmed Omar is a leading expert in health management and policy in the public health sector in Kenya and regionally. He earned both his bachelor's degree in dental surgery (BDS) and master's in public health (MPH) from the University of Nairobi, and Ph.D. in community health and development from the Great Lakes University (GLUK). He also undertook a Post-Doctoral Fellowship in Health Policy and Management at the Johns Hopkins School of Public Health and certificate in health decentralization from Harvard University. He has worked for the Kenya Ministry of Health for 15 years and with Management Sciences for Health (MSH), Kenya, for 4 years.

Mr. Akram Pasha is Director of the *Ashodaya* Academy, the research and training arm of *Ashodaya Samithi*, Mysore, India. Drawn from the community of male sex workers, he has been engaged in HIV work since early 2004 and has been an inspiration for many community members. He has been a part of the management team that develops strategic plans to roll out programs for *Ashodaya Samithi*. As an activist, he has participated in many key decision-making bodies and capacity building initiatives in India and the Asia-Pacific.

Ms. Drishya Pathak is a public health professional with five years of experience in the public health and development sectors. She completed her master's degree in health management from the International Institute of Health Management and Research in 2019 and her undergraduate degree in microbiology from the University of Delhi. She has presented several groundbreaking reports in the area of public health. She supported the planning, implementation, and documentation of the Second World Sustainable Development Forum in Durango, Mexico.

She is currently Research Associate with the Center for Human Progress. She is working on projects on the sexual and reproductive health, needs of key populations, and people living with HIV (PLHIV). She has hands-on experience of working closely on issues like AcuDetox, education and awareness, and gender empowerment. She was involved with the implementation and training of the Integrated Digital Adherence Technology (IDAT) Project on Tuberculosis. She approaches environmental sciences through a public health lens as demonstrated in her recent work on 'Leaching of Chemicals from Plastic Food Contact Materials into Food,' which was recognized on an international platform.

Ms. Manisha Reza Paul works with the Australian private sector as a management consultant. She works on health and rights of marginalized populations. She volunteers her time to *Ashodaya Samiti* in various capacity building and documentation initiatives. She has a master's degree in sustainability and is passionate about exploring sustainable solutions in public health.

Dr. Rashmi Pachauri Rajan is Social Scientist with public health experience and obtained her Ph.D. degree in community development from the Indian Institute of Technology, New Delhi, in 1988 and her master's degree in agricultural economics from the University of West Virginia, USA, in 1981.

Since 2019, she has been working in Wellington, New Zealand, as Senior Researcher with the Evaluation and Insights Team at Oranga Tamariki—Ministry for Children, New Zealand Government.

From 2007 to 2019, she worked on reproductive health and rights with Global Health Strategies (GHS); Creating Resources for Empowerment in Action (CREA); the Population Foundation of India (PFI); and PATH India. Earlier, she worked as Consultant in Family Health International, the Aga Khan Foundation, and the MacArthur Foundation.

From 2001 to 2007, she worked in New Zealand first with the Government's Department of Labour and later with the Inland Revenue Department on tax-related policy and program evaluations.

From 1996 to 2001, she lived and worked in Indonesia where she evaluated several HIV and AIDS projects. She was Member of the evaluation team for AusAID and USAID on bilateral programs on HIV and AIDS.

From 1988 to 1996, she worked on HIV and AIDS in India. She started an organization called *Pragnya*. She published a series of booklets entitled *Pragnya*, which documented pioneer NGO work in the areas of HIV and AIDS and reproductive health. She also co-authored a book on HIV and AIDS case histories, entitled *Whispers from Within.* She has a number of professional publications to her credit. She

has written poems since she was twelve years old. She published two collections of her poems titled 'Moods and Musings' in 1993 and 'On the Wings of a Songbird' in 2016.

Ms. Manjula Ramaiah is Treasurer of *Ashodaya Samithi*, Mysore, India, a sex worker organization. She has been on its board and has also functioned as its program director in the past. As Member of the sex worker community, she has contributed to the growth and development of the organization. She has been a part of the HIV-positive people's movement. She serves on the board of the Global Network of People Living with HIV/AIDS, the Global Network of Sex Work Projects, and the Asia-Pacific Network of Sex Workers. She is an expert spokesperson on sex worker rights and has been a leader in promoting rights-based HIV programs for marginalized populations.

Dr. Sushena Reza-Paul is Assistant Professor, Community Health Sciences at the University of Manitoba. She is Mentor to *Ashodaya Samithi*. She has been working over the last two decades with marginalized communities in different countries through UN, academic, and bilateral organizations in South/South-East Asia and Africa. Her work primarily focuses on community-led HIV/sexually transmitted infections, sexual and reproductive health research, and bringing innovative solutions based on the principles of public health and practice. She is currently working in several countries on policy and protocol development, HIV self-testing, and biomedical prevention of HIV in key populations.

Dr. Arti Singh completed her MD in medicine in 1993 from the Pandit Jawahar Lal Nehru Memorial Medical College in Raipur. She worked for two years at the Holy Family Hospital in New Delhi. In 1996, she joined the Kasturba Hospital, Bharat Heavy Electricals Limited (BHEL) in Bhopal, as Specialist Medicine. She is presently Head of the Department of Medicine at Kasturba Hospital, BHEL in Bhopal. She is also Co-ordinator of the Diploma of National Board (DNB) post-graduate courses organized in different specialities at Kasturba Hospital. She has a keen interest in academics and organizes a DNB Medicine postgraduate course in her department. About 15 research dissertations have been completed under her guidance. Her field of interest is clinical cardiology. She manages a successful noninvasive cardiac unit at the Kasturba Hospital, BHEL. She is Life Member of the Association of Physicians of India. She also has profound interest in the literature and writes short articles on varied subjects.

Dr. Ashutosh Singh completed his MD in Medicine from the Pandit Jawahar Lal Nehru Memorial Medical College in Raipur in 1993. He worked at the National Heart Institute in New Delhi for two and half years and underwent training in cardiology. In 2001, he took special training in Enhanced External Counter Pulsation (EECP) in the USA. He started delivering this therapy to cardiac patients for the first time in India in April 2001. He is currently a consultant physician in Bhopal. He is Life Member of the Association of Physicians of India and Associate Fellow of the Indian Society of Cardiology.

Dr. Sanghamitra Singh is Health Scientist and holds a Ph.D. in cell biology from the George Washington University (GWU), Washington D.C. She works with the research and evaluation team at Population Foundation of India and is their technical expert on health issues, overseeing the development and dissemination of the Foundation's work, literature, and publications. She previously worked as Researcher at GWU, National Institutes of Health Maryland, Federal Drug Administration (FDA) Maryland, as well as at the Ajinomoto Corporation in Tokyo, Japan.

Dr. Bulbul Sood holds an MBBS and an MPH and is Member of the National Academy of Medical Sciences. She is a public health professional with more than 45 years of experience. She was Professor of preventive and social medicine at the Lady Hardinge Medical College, New Delhi, for 23 years.

She has been Jhpiego's India Country Director since 2009. She is a respected figure in the public health field and is known for her experience in international health and development. She has strong technical expertise in reproductive health and extensive program management experience. She is well known in the fields of family planning, maternal, and reproductive health—in both India and internationally.

She was Co-chairperson of the White Ribbon Alliance for Safe Motherhood in India (WRAI) from 2003 to 2009 and was successful in moving the country's safe motherhood agenda forward by working collaboratively with the government, bilateral and multilateral donors, UN organizations, and international and national NGOs.

She has worked untiringly with the Indian Nursing Council and the Government of India at the national and state levels to strengthen the nursing and midwifery cadres in the country. She is Member of Family Planning Medical Eligibility Decision-Making Committee of WHO and USAID. She is also Member of the INFO Editorial Advisory Committee of the Johns Hopkins Bloomberg School Public Health Center for Communication Programs and peer-reviewer for Continuous Identification of Research Evidence System, which is a collaborative effort of WHO's Department of Reproductive Health and Research and the Centers for Disease Control, Atlanta. She is a peer-reviewer of the WHO's Medical Eligibility Criteria for Contraceptive Use and for the Selected Practice Recommendations for Contraceptive Use Guidelines.

She is Technical Advisory Group Member of the Maternal Health Task Force of the Harvard School of Public Health, Member of the State Innovation in Family Planning Service Agency in Uttar Pradesh, and Governing Board Member of Indian Institute of Health Management and Research (IIHMR), Delhi. Earlier, she served as Country Director of the Center for Development and Population Activities (CEDPA) in India, overseeing its reproductive, maternal health, women empowerment, and adolescent health activities in the country.

Dr. Sundar Sundararaman is Psychiatrist and Public Health Practitioner. He has been a part of the Indian HIV response since 1986 and has been instrumental in promoting strong national policy and advocating for people-centric program development over the last three decades. He has been involved in advising several countries in the region on HIV/AIDS and is an avid civil society actor in community-led solutions in public health.

Ms. Nandita Suneja with over 12 years of experience in journalism is a communications specialist who likes to keep her reporter's hat firmly on as she develops communication strategies and media campaigns on health and development issues. As a Project Lead at Global Health Strategies, a public health communications firm, she designs and implements a media advocacy project working with prominent Indian news editors to mainstream health reporting. Her interest lies in bridging the gap between technical experts and journalists to enable a factual information environment that empowers people to make informed choices.

She was earlier based in Sydney where she provided communication support to the School of Population Health, University of New South Wales. A keen follower of media trends in the digital age, she is interested in research on the rise of misinformation and its impact on health, politics, and society.

She has a bachelor's degree in mathematics from the St. Stephen's College, University of Delhi.

Dr. Ravi Verma is Regional Director for the International Center for Research on Women's (ICRW) Asia Office in New Delhi and leads ICRW's local and regional efforts to conduct research, provide technical support, build capacity, and partake in policy dialogue on an array of issues pertaining to gender equality as it relates to adolescent health and education, child marriage, violence against women and girls, and reproductive health including family planning. She was appointed as Member on the High-Level Committee on the Status of Women, Government of India, during 2013–16, the report of which informed the National Policy on Women, 2016. He was also Designated Member of the Rights and Empowerment Working Group for Family Planning 2020.

He is currently Member of the Indian Council of Medical Research's National COVID-19 Taskforce—Operations Research Committee constituted by the Government of India. He currently serves on the International Advisory Board of Lancet—Women and on the Lancet Commission on Gender and Global Health. He is Member of the International Advisory Board of Global Health 5050 and Women Lift Health. Prior to joining ICRW, he was Professor at the International Institute for Population Sciences (IIPS), Mumbai, for over two decades and later worked with the Population Council, India.

Acronyms

AAY	Antyodaya Anna Yojana
ACT	Access to COVID-19 Tools
ACT	COVID-19 Tools Accelerator
AGCA	Advisory Group on Community Action
AIIMS	All India Institute of Medical Sciences
AMC	Advance Market Commitment
ANC	Antenatal Care
ANC	Antenatal Check-up
ANM	Auxiliary Nurse Midwife
APL	Above Poverty Line
ART	Antiretroviral Therapy
ASHA	Accredited Social Health Activist
AWCs	Anganwadi Centers
AWW	Anganwadi Worker
AYA	Adolescents and Young Adults
AYUSH	Ayurveda, Yoga and Naturopathy, Unani, Siddha, and Homeopathy
BARC	Broadcast Audience Research Council of India
BE	Bankers Edition
BEXIMCO	Bangladesh Export Import Company Limited
BHEL	Bharat Heavy Electrical Limited
BHU	Banaras Hindu University
BLS	Basic Life Support
BMGF	The Bill and Melinda Gates Foundation
BPL	Below Poverty Line
CARP	Coronary Artery Revascularization Prophylaxis
CB-NAAT	Cartridge-Based-Nucleic Acid Amplification Testing
CBOs	Community-Based Organizations
CCDC	Continuous Change Detection Classification
CCWGs	Critical Care Working Groups
CDC	Centers for Disease Control

CDCP	Centers for Disease Control and Prevention
CDSCO	Central Drug Standard Control Organization
CEDPA	Center for Education, Development, and Population Activities
CEO	Chief Executive Officer
CEPI	Coalition for Epidemic Preparedness Innovation
CGH	Common Goods for Health
CGPP	Core Group Polio Project
CIFF	Children's Investment Fund Foundation
CLIA	Chemiluminescence Enzyme Immunoassay Antibody
cLMIS	Contraceptives Logistics Management Information System
CNN	Cable News Network
COSSI	COVID-19 Supply Susceptibility Index
COVAX AMC	COVID-19 Vaccines of Global Access Facility Advance Market Commitment
COVAX	COVID-19 Vaccines of Global Access Facility
COVID ICUs	COVID Intensive Care Units
COVID-19	Coronavirus Disease 2019
CREA	Creating Resources for Empowerment in Action
CRISPR	Clustered Regularly Interspaced Short Palindromic Repeat
CRRF	COVID-19 Response and Recovery Fund
CSIR	Council of Scientific and Industrial Research
CSOs	Civil Society Organizations
CSR	Corporate Social Responsibility
CT Scan	Computed Tomography Scan
CUReD	CSIR Ushered Repurposed Drug
DASRA	Dasra Adolescents Collaborative
DASS	Depression, Anxiety, and Stress Scale
DBT	Department of Biotechnology
DBT	Direct Benefit Transfers
DCGI	Drugs Controller General of India
DCH	Dedicated COVID Hospital
DCHC	Dedicated COVID Health Center
DCVMN	Developing Countries Vaccine Manufacturers Network
DMI	Development Media International
DMPA-SC	Depot-medroxyprogesterone Acetate-Subcutaneous
DNA	Deoxyribonucleic Acid
DNB	Diploma of National Board
DPH&FW	Director of Public Health and Family Welfare
DRCI	Depression-Related Cognitive Impairment
DR-TB	Drug-Resistant Tuberculosis
DST	Department of Science and Technology
DST	Drug Susceptibility Testing
EAG	Empowered Action Group
EC	Emergency Contraception
ECG	Electrocardiogram

ECHO	Extension for Community Healthcare Outcomes
EECE	Early Childhood Children Education
EECP	Enhanced External Counter Pulsation
EIS	Epidemic Intelligence System
ELISA	Enzyme-Linked Immuno-Sorbent Assay
EU	European Union
EUA	Emergency Use Authorization
eVIN	Electronic Vaccine Intelligence Network
FAO	Food and Agricultural Organization
FAQs	Frequently Asked Questions
FC	Finance Commission
FCDO	Foreign, Commonwealth and Development Office
FDA	Federal Drug Administration
FDA	Food and Drug Administration
FGDs	Focus Group Discussions
FIR	First Information Report
FMS	Financial Management System
FOGSI	Federation of Obstetrics and Gynaecological Society of India
FP	Family Planning
FRSH	Fellow of the Royal Society of Health
FRHSI	Foundation for Reproductive Health Services India
FSSAI	Food Safety and Standards Authority of India
FSWs	Female Sex Workers
GAVI	Global Alliance of Vaccine and Immunization
GBV	Gender-Based Violence
GDP	Gross Domestic Product
GEMS	Gender Equity Movement in Schools
GFATM	Global Fund to Fight AIDS, Tuberculosis, and Malaria
GFF	Global Financing Facility
GHG	Greenhouse Gas
GHS	Global Health Strategies
GLOPAN	Global Panel on Agriculture Food Systems and Nutrition
GoI	Government of India
GoZ	Government of Zambia
GSDP	Goods State Domestic Product
GST	Goods and Service Tax
GWU	George Washington University
HCW	Healthcare Worker
HFSS	High Fat, Sugar, and Salt
HH	Household
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
HP+	Health Policy Plus
HPI	Human Poverty Index
HPL	Havells Electronic Private Limited

HWC	Health and Welfare Center
HWC	Health and Wellness Center
IBVPDs	Invasive Bacterial Vaccine for Preventable Diseases
ICDS	Integrated Child Development Scheme
ICMR	Indian Council of Medical Research
ICN2	Second International Conference on Nutrition
ICRW	International Center for Research on Women
ICU	Intensive Care Unit
IDAT	Integrated Digital Adherence Technology
IEC	Information, Education, and Communication
IEG	Institute of Economic Growth
IFA	Iron and Folic Acid
IFPRI	International Food Policy Research Institute
IFRP	International Fertility Research Program
IgG ELISA	Immunoglobulin G Enzyme-Linked Immuno-Sorbent Assay
IgH	Immunoglobulin H
IgM	Immunoglobulin M
IHR	International Health Regulations
IIHMR	International Institute of Health Management Research
IIPS	International Institute of Population Sciences
ILO	International Labor Organization
IMS	Institute of Medical Sciences
IPAS	International Pregnancy Advisory Services
IPC	Infection Prevention and Control
IPPF	International Planned Parenthood Federation
IPV	Inactivated Polio Vaccine
IRC	International Rescue Committee
IUD	Intrauterine Device
IVCF	Infant and Young Child Feeding Practices
IVI	International Vaccine Institute
IVR	Interactive Voice Response
LGBTQ	Lesbian, Gay, Bisexual, Transgender, and Queer
LGBTQI	Lesbian, Gay, Bisexual, Transgender, Queer, and Intersex
LGBTQIA	Lesbian, Gay, Bisexual, Transgender, Queer, Intersex, and Asexual
LHV	Lady Health Visitor
LIC	Life Insurance Corporation
LMICs	Lower- and Middle-Income Countries
mCPR	Modern Contraceptive Prevalence Rate
MDM	Mid-day Meal Scheme
MDR-TB	Multi-Drug-Resistant Tuberculosis
MEA	Ministry of External Affairs
MERS	Middle East Respiratory Syndrome
MERS-CoV	Middle East Respiratory Syndrome Coronavirus
MIT	Massachusetts Institute of Technology
MLA	Member of Legislative Assembly

MMT	Million Metric Tons
MNREGA	Mahatma Gandhi National Rural Employment Guarantee Act
MoH	Ministry of Health
MoHFW	Ministry of Health and Family Welfare
MOM	Multiple Forms of Malnutrition
MoWCD	Ministry of Women and Child Development
MR	Menstrual Regulation
MSD	Merck Sharp and Dohme
MSI	Marie Stopes International
MSMEs	Micro, Small, and Medium Enterprises
MSP	Minimum Support Price
MSV	Monitoring and Support Visit
MSWs	Male Sex Workers
MWCD	Ministry of Women and Child Development
NARI	National AIDS Research Institute
NCDs	Non-Communicable Diseases
NCID	National Center of Infectious Diseases
nCoV	Novel Coronavirus
NDHM	National Digital Health Mission
NEGVAC	National Expert Group on Vaccine Administration for COVID-19
NEIGRIHMS	North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences
NFHS	National Family Health Survey
NFSA	National Food Security Act
NGOs	Non-Governmental Organizations
NHA	National Health Accounts
NHL	National Health Laboratory
NIH	National Institutes of Health
NIMHN	National Institute of Mental Health and Neurosciences
NITI Aayog	National Institution for Transforming India Aayog
NITI	National Institution for Transforming India
NIV	National Institutes of Virology
NMC	National Medical Commission
NNM	National Nutrition Mission
NPHL	National Public Health Laboratory
NPY	Nikshay Poshan Yojana
NSS	National Sample Survey
NSS	National Statistical Survey
NSSO	National Statistical Survey Organization
NTAGI	National Technical Advisory Group on Immunization
NTPC	National Thermal Power Corporation
OCPs	Oral Contraceptive Pills
OCV	Oral Cholera Vaccine
OECD	Organisation of Economic Co-operation and Development
ONORC	One Nation One Ration Card

OOPE	Out-of-Pocket Expenditure
OPD	Outpatient Department
OPV	Oral Polio Vaccine
OT	Operation Theater
PAHO	Pan American Health Organization
PATH	Program for Appropriate Technology in Health
PCV	Pneumococcal Conjugate Vaccine
PDS	Public Distribution System
PEA	Political Economy Analysis
PFI	Population Foundation of India
PHC	Primary Health Care
PHC	Public Health Center
PHFI	Public Health Foundation of India
PHH	Primary Household
PHH	Priority Household
PHN	Public Health and Nutrition
PhRMA	Pharmaceutical Research and Manufacturer Association
PIL	Public Interest Litigation
PIP	Program Implementation Plan
PLHIV	People Living with HIV
PLWH	People Living With HIV
PMCARES	Prime Minister's Citizen Assistance and Relief in Emergency
PMGKAY	Pradhan Mantri Garib Kalyan Anna Yojana
PMGKY	Pradhan Mantri Garib Kalyan Yojana
PoC	Pathway of Change
POP	Protect Our Planet
PPA	Personal Awareness and Attitude
PPE	Personal Protection Equipment
PPF	Public Provident Fund
PRI	Panchayati Raj Institution
PSCS	Personal Social Capital Scale
PSQI	Pittsburgh Sleeping Quality Index
PWD	Population Welfare Department
QI	Quality Improvement
QR	Quick Response
RAHI	Recovering and Healing from Incest
RAT	Rapid Antigen Testing
RCH	Reproductive and Child Health
RDIF	Russian Direct Investment Fund
RE	Retained Earning
RGA	Reinsurance Group of America
RH	Reproductive Health
RISE	Reaching Impact Saturation and Epidemic Control
RKSK	Rashtriya Kishor Swasthya Karyakram
RMNCH+A	Reproductive, Maternal, Neonatal, Child, and Adolescent Health

RNA	Ribonucleic Acid
Ro	Reproduction Number
RRA	Rapid Recovery Assessment
rRT-PCR	Real-time Reverse Transcriptase-Polymerase Chain Reaction
RTGS	Real-Time Governance Society
RT-LAMP	Reverse Transcriptase-Loop Mediated Isothermal Amplification
RT-PCR	Reverse Transcriptase-Polymerase Chain Reaction
SAARC	South Asian Association for Regional Corporation
SAGE	Strategic Advisory Group of Experts
SAM	Severe Acute Malnutrition
SARS	Severe Acute Respiratory Syndrome
SARS-CoV-2	Severe Acute Respiratory Syndrome Coronavirus 2
SAS	Self-rating Anxiety Scale
SASR	Stanford Acute Stress Reaction
SBCC	Social and Behavioral Change Communication
SDGs	Sustainable Development Goals
SEC	State Emergency Committee
SGT	Shree Guru Gobind Tricentenary University
SHG	Self-Help Group
SIDA	Swedish International Development Authority
SII	Serum Institute of India
SMS	Sanitizing, Masking, and Social Distancing
SNDT	Shreemati NathiBai Damodar Thackersey University
SOP	Standard Operating Procedure
SPIF	Suicide Prevention India Foundation
SPOT	Oxygen Saturation in Blood
SRH	Sexual and Reproductive Health
SRH/FP	Sexual and Reproductive Health/Family Planning
SRHR	Sexual and Reproductive Health and Rights
SRUTI	Society for Rural, Urban, and Tribal Initiative
STD	Sexually Transmitted Disease
SVT	Sir Vithaldas Thackeray College
TA	Technical Assistance
TAT	Turn Around Time
TB	Tuberculosis
TCV	Typhoid Conjugate Vaccine
TG	Transgender
THE	Total Health Expenditure
TISS	Tata Institute of Social Sciences
ToP	Termination of Pregnancy
TPDS	Targeted Public Distribution System
TV	Television
TWG	Technical Working Group
UBC	University of British Columbia
UHC	Universal Health Coverage

UIP	Universal Immunization Programme
UK	United Kingdom
UNAIDS	United Nations Programme on HIV/AIDS
UNDP	United Nations Development Programme
UNFPA	United Nations Population Fund
UNICEF	United Nations International Children's Emergency Fund
UNIFEM	United Nations Development Fund for Women
UP	Uttar Pradesh
UPDS	Universal Public Distribution System
US	United States
USA	United States of America
USAID	United States Agency for International Development
USCDC	United States Centers for Disease Control
USGAO	US Government Accountability Office
UTs	Union Territories
VHNDS	Village Health and Nutrition Days
VPDs	Vaccine Preventable Diseases
WCO	World Health Organization Country Office
WFP	World Food Program
WHO	World Health Organization
WHP	World Health Partners
WISH	Women's Integrated Sexual Health
YP Foundation	Young People's Foundation

Chapter 1
Introduction: Context of the Book

Saroj Pachauri and Ash Pachauri

Abstract On January 30, 2020, India reported the first case of COVID-19 in Kerala. The index case was identified as a student returning from Wuhan. As of February 3, 2020, a total of three cases were confirmed in Kerala. However, after a month the number of cases in the country increased dramatically. On March 14, 2020, India reported its first two COVID-19-related deaths. India's case fatality ratio remained constant at 3.2 percent until June 9, 2020, when it dropped to 2.8 percent. On March 11, 2020, when WHO declared COVID-19 as a pandemic, Indian authorities banned visas and non-essential travel from affected countries. Subsequently, all international passengers returning to India were required to go through a screening test.

On March 25, 2020, the Government of India imposed a sudden complete national lockdown for 21 days. After imposition of the lockdown, the government released several guidelines on protection measures such as making wearing face masks compulsory in public places, social distancing, and avoiding mass gatherings.

As on February 5, 2020, India had a testing capacity of only 11 laboratories for testing for COVID-19. But by June 12, 2020, it had ramped up its capacity to 885 laboratories that conducted more than 125 tests a day. However, India conducts remarkably fewer tests as compared to other countries.

After detecting the first case of COVID-19 on January 30, 2020, India experienced a delayed growth in its test count. Subsequently, however, India recorded a constantly increasing daily incidence rate. By December 30, 2020, the number of cases in India was recorded at 10.2 million. The authors provide a preview of all the chapters in the book.

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1

The COVID-19 Pandemic Dynamics and Response in India

In December 2019, COVID-19 was first identified in Wuhan, China, as a respiratory tract infection causing symptoms, such as fever, chills, dry cough, fatigue, and shortness of breath [1, 2]. This atypical viral pneumonia has disabled the world, causing health, economic, and humanitarian crises. The novel coronavirus belongs to the family of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome coronavirus (MERS-CoV), but the impact of the former is more severe as illustrated by the exponential increase in infectious cases [2, 3]. The incubation period of COVID-19 is 1–14 days, during which asymptomatic carriers of the virus can transmit the disease to healthy people, as proven by the evidence of human-to-human transmission via droplets or contact [2–4]. At the end of January 2020, the World Health Organization (WHO) declared COVID-19 as a Public Health Emergency of International Concern according to the standards of International Health Regulations (2005) [5]. Due to the unprecedented spread of the virus, the world has gone into multiple lockdowns as several countries have imposed strict restrictions and screening of potential cases [6].

On January 30, 2020, India reported the country's first case of COVID-19 in Kerala. The index case identified was a student returning from Wuhan. As of February 3, 2020, a total of three cases were confirmed in Kerala. By February 20, 2020, they were declared recovered [7]. Little information was provided regarding the initial COVID-19 cases in India, and thus, it is unknown whether they were contacts of the first case or whether they had a travel history [2]. However, after a month the number of cases started to increase dramatically. According to the Ministry of Health and Family Welfare, the transmission of COVID-19 was mainly related to travel and local transmission of imported cases. Limited community transmission was reported on March 30, 2020 [8]. However, Klein et al. indicate that community transmission in India most likely started at the beginning of March [9].

On March 14, 2020, India reported its first two COVID-19-related deaths. Both patients were over the age of 65 years and had comorbidities [7]. Throughout the first weeks of the outbreak and until mid-May, India's case fatality ratio remained stable at a constant 3.2%. As of June 9, 2020, the case fatality ratio dropped to 2.8% by 0.6 deaths per 100,000. India's case fatality ratio resembled the aggregated case fatality ratio of the South-East Asia Region [7].

The availability of desegregated data was sparce. However, according to a press release by the Ministry of Health and Family Welfare on April 6, 2020, 76% of confirmed cases were male. The age distribution of confirmed cases was as follows—47% were below 40 years, 34% were between 40 and 60 years, and 19% were 60 years and older. Furthermore, desegregated mortality data was reported: 73% of reported deaths were male and 27% female. Although only 19% of cases were among elderly people, 63% of deaths were in the age group of 60 and above. About 30% were between 40 and 60 years, and 7% were younger than 40 years. Moreover, 86% of the casualties suffered from comorbidities [10].

Travel Restrictions

On January 30, 2020, after the WHO's declaration of COVID-19 as a Public Health Emergency of International Concern, the civil aviation authority began universal health screening of international passengers at the entry point from China by temperature check and filing self-declaration forms in line with the International Health Regulations 2005 for point of entry screening [2, 5, 7]. Screening expanded for passengers traveling from other countries as COVID-19 began spreading globally [11]. States with no international airports and/or seaports began monitoring the influx of travelers by rail and road to check for potential cases [7]. On March 11, 2020, when WHO declared COVID-19 as a pandemic, Indian authorities banned visas and nonessential travel from affected countries, including China, Iran, Italy, South Korea, France, Spain, and Germany. Travel restrictions began on March 13, 2020, as visa issuance was restricted to essential travel and delegates only. Subsequently, all international passengers entering India were required to go through screening tests. The travel ban expanded to all European countries and nations of the Middle East on March 18, 2020 [12].

Passengers with COVID-19, arriving from affected countries, were put in quarantine for 14 days in the port of arrival city, while asymptomatic and/or healthy passengers were advised to commence home quarantine and test for COVID-19 should symptoms appear [2, 13]. Passengers' left hand was stamped with inedible ink to maintain the date and time for home quarantine, a move that could risk stigma on account of COVID-19 suspicion [14]. Individuals violating quarantine could be penalized under the Indian Penal Code sections 188, 269, and 270, that is, 'violation of order promulgated,' 'negligently doing any act known to be likely to spread infection of any disease dangerous to life,' and 'malignantly doing any act known to be likely to spread infection of any disease dangerous to life,' respectively [15].

As a stringent lockdown was imposed in Wuhan, the Indian Air Force evacuated 112 nationals stranded in Wuhan, 76 Indians, and 36 foreign nationals, to Delhi, while also providing 15 tons of medical equipment and safety kits to China [2, 16]. Following the subsequent surge of COVID-19 cases in Italy, Air India evacuated Indians from Rome and Iran. All evacuees were taken to quarantine in Delhi [17]. On March 14, 2020, all public gathering areas, such as cinemas, malls, marriage halls, pubs, marathons, and bars, were closed [7]. Section 144 of the Indian penal code on unlawful gatherings of more than four people was imposed to avoid crowds [10]. The Ministry of Home Affairs postponed indefinitely the decennial 16th National Population Census for 2021, originally to be conducted during April, 2020 [2, 18]. The Prime Minister of India declared March 22, 2020, as '*Janta* (People's) Curfew' to ensure social distancing, before enforcing a nationwide lockdown for 21 days, starting March 25, 2020 [18]. Any person caught violating the lockdown for nonessential reasons was baton charged by the police deployed in city streets. However, the baton charge and excessive force used by the police received criticism, as reported by Human Rights Watch [2, 14].

On March 25, 2020, the Government of India imposed a sudden complete nation-wide lockdown for 21 days, with the closure of nonessential markets and a complete halt to all national rail networks and international and domestic flights [2, 7]. However, these sudden restrictions turned into a challenge for daily-wage workers and migrant laborers who could not continue to earn their living nor return to their hometowns, due to the closure of rail and road networks [19]. The short notice before commencing lockdown of a population of 1.3 billion stranded thousands of migrants. This garnered severe criticism as the government had not managed the migrant crisis despite releasing 265 billion dollars of relief funds to tackle COVID-19 [2]. The sudden lockdown resulted in scores of migrants walking back home for miles, essentially risking viral transmission through their long journey [19]. The Home Ministry urged the creation of temporary shelters for citizens affected by the restrictions, with all states and union territories expected to follow suit [18]. However, the mass exodus of migrant laborers continued to occur, as only limited dedicated buses and trains for migrants were arranged by the state governments. Moreover, due to the onset of summer and heat waves, many migrant laborers perished during their journey home [20].

India went under four phases of lockdown extensions and entered its fifth phase on June 8, 2020, where regions deemed safe, called 'green zones,' eased restrictions for movement and business operations, whereas danger 'red' zones continued stringent travel and trade restrictions [18]. However, limited domestic air and rail travel resumed with appropriate safety precautions for citizens that demonstrated necessity post-May 25, 2020, and June 1, 2020, respectively. An 'unlock' phase coincided with the 5th lockdown in order to restart selected businesses, educational institutions, and local public transport, while maintaining distance and hygiene [7, 18].

COVID-19 updates were made available online through a crowd-sourced Web site, which was launched by a group of volunteers to present an estimate of cases occurring daily all over the country. This Web site gathered data from state press releases, official government links, and reputed news sources to compile information [21]. Other Web site sources included data from the Ministry of Health and Family Welfare which presented explicit, graphical information of infectious cases [22].

The Government of India also launched a mobile application called *Aarogya Setu* on April 2, 2020, for citizens to be informed about their potential risk of infection, medical advisories, and health practices to contain COVID-19, to self-assess their symptoms, as well as to ensure contact tracing. It was mandated that the application must be downloaded onto smartphones by domestic travelers to assist in contact tracing [7].

While the Indian government was praised for instituting an early lockdown, it has been criticized for imposing among the harshest lockdowns worldwide. Several of India's prominent epidemiologists warned against a lockdown in the absence of civil organization [23]. Amid the government's controversial Citizen Amendment Act, passed at the end of 2019, aimed at providing Indian citizenship to people of certain religious backgrounds, civil unrest that arose before the pandemic hit the country. Persisting stigmatization and persecution of Muslims resulted in their initial blame for spreading the infection in India [2, 24]. Such offensive behavior extended

to healthcare workers who were dispelled as 'carriers of the infection' and denied entry to their own homes by neighbors. Moreover, the Prime Minister's emphasis on 'self-reliance' during the pandemic raised questions, given the country's scarce resources and inability to meet demands for healthcare provision, risk mitigation, and management strategies [24].

The COVID-19 Health Advisory

On January 30, 2020, with the advice of the WHO, the Government of India initiated awareness of proper hygiene and sanitation advice to prevent the spread of disease [25]. A major focus was put on proper hand-washing, covering oneself while coughing and sneezing, social distancing, thorough cooking of meat, and avoiding contact with live animals in farms and markets. The WHO Country Office (WCO) of India worked with the Indian Council of Medical Research (ICMR) and the National Center for Disease Control to build laboratory and disease surveillance capacity [26].

By March 9, 2020, WCO, along with the Ministry of Information and Broadcasting, directed all telecom operators in India to launch a special COVID-19 caller tune to raise awareness about prevention strategies [7]. In a bid to amplify sales, Reckitt Benckiser, a prominent health, hygiene, and home products company, released a liquid handwash advertisement, vilifying rivals Hindustan Unilever's soap bar by claiming that the former's liquid handwash was more effective for cleaning hands [2]. The Bombay High Court suspended the ad for one month from March 22 to April 21 to stop unverified claims and misleading information [27].

Guidelines on protection measures such as wearing face masks in public places were provided by the government after the first lockdown in March [28]. Guidelines, such as social distancing, avoiding spitting in public, and avoiding mass gatherings, were enforced [2].

Following the proliferation of misinformation through social media regarding false remedies and fake news, the Government of India launched a 'MyGov Corona Helpdesk' on the highly popular social media application WhatsApp. This channel served to distribute accurate and verified information to Indian audiences [28]. Widespread rumors were addressed by WHO and physicians about various false claims regarding surveillance, testing, and treatment (e.g., alcohol and garlic intake as a cure) and avoiding large-scale panic purchases [28].

Testing and Screening for COVID-19

By the end of March, through rigorous point of entry surveillance efforts, India had conducted thermal scans on more than 1.5 million passengers at the airports, placing thousands of passengers under surveillance and in home-based isolation [7]. As of

February 5, 2020, India increased testing capacity with the help of eleven new laboratories including the National Institute of Virology in Pune [7]. By March 9, 2020, India further increased the network of laboratories fit for testing COVID-19 to 52. And, by the end of March, this network was further expanded to more than 100 laboratories [7]. As a result, the number of tested samples increased correspondingly. At the beginning of February, the laboratories tested 49 samples. This number moderately increased to 2880 by February 28, 2020, before testing began more rigorously and increased to 22, 928 samples by March 25, 2020 [29]. By mid-April, India further increased testing capacity to 229 private and government laboratories raising its testing to 195,748 samples [7, 29, 30]. On May 18, 2020, India reached a milestone of 100,000 tests in one day [7]. As of June 12, 2020, India ramped up its capacity to a total of 885 laboratories fit for testing for COVID-19, conducting more than 125,000 tests a day [7, 31]. However, despite the significantly increased capacity from 130 tests per million on April 11, 2020, India conducts remarkably fewer tests as compared to other countries [32]. Additionally, Ray et al. doubt that the cases reported reflect the actual epidemiological situation and mention that the number of truly affected cases 'depends on the extent of testing, the accuracy of the test results, and, in particular, frequency and scale of testing of asymptomatic cases who may have been exposed' [33].

In order to contain the spread of the disease, ICMR reviews and updates the testing strategy periodically. Accordingly, ICMR defined criteria for testing asymptomatic patients and patients with influenza-like symptoms and conditions on March 20, 2020, and April 9, 2020, respectively [34, 35]. ICMR's sero-survey with IgG ELISA test showed that 0.73% of the enrolled 26,400 individuals had contracted SARS-CoV-2 leaving a large proportion of the population still susceptible [2, 36]. ICMR also issued infection control, clinical management, and treatment protocols for COVID-19. However, paradoxically, access to and distribution of treatment and pharmaceuticals have been affected by the pandemic itself.

COVID-19 Treatment and the Impact on Pharmaceuticals

With Chinese production activities suspended, Indian pharmaceutical companies were threatened by a short supply of pharmaceutical ingredients. China delivers almost 70% of the active pharmaceutical ingredients for medicines produced by Indian companies, leaving India vulnerable in managing its fragile supply chain during the COVID-19 pandemic [37]. In addition, hoarding and panic buying created an artificial shortage of active pharmaceutical ingredients, leading to a bulge in the price for paracetamol, vitamins, and penicillin [2, 37]. As a protective measure, the Government of India installed an export ban on essential medicines [2, 38]. Both disruption in supply and export restrictions threatened the availability of essential and generic medicines. Considering the production capacities of Indian pharmaceutical companies, preventing a disruption to India's production and supply chains increased their preparedness for large-scale production for COVID-19 diagnostic tools and

vaccine candidates. Furthermore, there was a political will to incentivize the industry to increase domestic manufacturing capacity of active pharmaceutical ingredients and strengthen national security by decreasing dependence on Chinese imports [37].

However, it is important to guard against what Newton et al. warn as risks to the supply and quality of tests, drugs, and vaccines imposed by a lack of evidence and quality [39]. For example, the Medicine Quality Monitoring Globe Index in India reported issues related to substandard or falsified medical products. There were reports regarding fake vaccines and hand sanitizers sold at exorbitant prices [40]. The antimalarial drug hydroxychloroquine was also substantially used as a prophylaxis for COVID-19 [41]. While ICMR's revised treatment protocols allowed hydroxychloroquine to be prescribed to patients in the early course of the disease, they also advised against the use of the antimalarial in patients with severe disease since the evidence for its use 'remains limited.'

India initially banned the export of hydroxychloroquine for meeting domestic demand; however, the ban was partially lifted after the US government requested the export of hydroxychloroquine for prevention [2]. The drug was later exported to 20 more countries that placed requests for the tablets [42]. India supplies 70% of the world's hydroxychloroquine and aims to export 250 million hydroxychloroquine tables to countries seeking the medicine [43]. However, due to a lack of evidence on the efficacy of the drug, WHO recommended that hydroxychloroquine undergoes a solidarity trial in over 35 countries [44, 45].

In addition to various treatment options, there was a strong push to develop a COVID-19 vaccine, which could be distributed to the public quickly. Latest updates suggest that the Oxford–AstraZeneca vaccine is expected to become the mainstay of India's vaccination program. The Subject Expert Committee will analyze the latest data submitted by the Serum Institute of India on the indigenous vaccine candidate by Bharat Biotech. India rolled out its vaccination program in January 2021 with the aim of inoculating 300 million persons in the first phase by July 2021.

This section has provided insight into the initial pandemic dynamics and response in India based on a review of the literature. It is evident that the COVID-19 situation presents significant challenges for India's healthcare infrastructure and economics. Given India's population of 1.3 billion and its very limited expenditure on public health to meet the needs of its population, the impact of the COVID-19 pandemic on the country's health infrastructure and economy may be difficult to fully and accurately assess at this point. However, all evidence suggests that the pandemic will likely cause a significant dent in the current health system.

India's overall healthcare system has limited capacity and a strong focus on primary health care delivery. The country's healthcare expenditure is 3.5% of the national gross domestic product (GDP). However, only 1.28% of government public expenditure of total government revenue is used for healthcare expenditure, indicating a high out-of-pocket burden [2].

After detecting the first case of COVID-19 on January 30, 2020, India experienced a delayed growth in its case count. The initial spread was mainly driven by imported cases and local transmission. However, there are some studies that indicate community transmission was prevalent by March 2020. Subsequently, India recorded

a constantly increasing daily incidence. As of December 30, 2020, the number of cases in India was recorded at 10.2 million.

The Context of This Book

In this section, the multiple health dimensions of COVID-19 in India and other countries are summarized. The authors have contributed chapters on various health aspects of the problem. These include responses to the impact of the pandemic on health services, technologies such as tele-medicine and other virtual solutions, comorbidities such as tuberculosis (TB), clinical aspects of COVID-19, continuity of sexual and reproductive health and family planning services and self-care in Sub-Saharan Africa and Asia. The impact of COVID-19 on mental health is analyzed. Its effect on sexual and reproductive health and family planning is examined. And its impact on nutrition and hunger is discussed. The impact of the pandemic on vulnerable groups including interstate migrants and female sex workers is assessed. The gender dimensions of COVID-19 are also analyzed. Health financing in the COVID era is examined. A detailed description is provided on the development, procurement, and distribution of vaccines in India. And finally, the successful experience of New Zealand and lessons drawn from countries in Asia that have successfully contained the pandemic are discussed.

As the pandemic is evolving rapidly, data related to COVID-19 changes almost every day. The data provided by the authors pertains to the time when they wrote their chapters. It will certainly change by the time this book is published.

Responding to the Impact of COVID-19 on Health Service Delivery

The COVID-19 pandemic has placed an enormous load on the health systems of all countries. The pressure on the health systems of low- and middle-income countries has been particularly serious as these countries have a fragile health infrastructure. The delivery of all health services, including essential services, has been affected because attention and resources have been deflected to providing services for COVID-19 patients.

The abrupt national lockdown implemented by the Government of India on March 24, 2020, resulted in an unexpected closure of the healthcare system which was devastating. There was a disruption in health services countrywide. There was no access to essential health services. People could not access sexual and reproductive health services or services for tuberculosis (TB) and other communicable and non-communicable diseases. The impact of and response to these service delivery problems are discussed by the authors.

Investing in a Resilient and Responsive Healthcare System During COVID-19 Pandemic

Bulbul Sood discusses strategies implemented by Jhpiego nationally and in 15 states of India to respond to the COVID-19 emergency and to counter the devastating impact of the pandemic. By the time the nationwide lockdown was imposed in March 2020, Jhpiego's COVID-19 response strategy was in action. This strategy included strengthening the capacity of the health workforce, supporting the national and the state governments, and ensuring the continuation of essential health services including reproductive health services. Jhpiego mounted a swift multi-sectoral and multipronged program to provide technical support for enhancing the preparedness of the healthcare system across 15 states. Training and monitoring activities were conducted using virtual platforms. A decentralized approach was employed to co-design with the community local solutions for health problems. The thrust was on developing community-centered, community-owned, and community-driven programs. Digital technology, including tele-medicine and other innovative solutions, played a key part in these efforts.

The program envisaged providing technical assistance for building a resilient healthcare system by strengthening governance mechanisms and facility-based preparedness, piloting an integrated disease surveillance system, enhancing the use of data to guide evidence-based decision-making, redesigning public health facilities, and setting up rapid response teams which can be quickly mobilized to respond to crises.

Using Technology to Harness Existing Resources for an Emergency: COVID-19 Response

Gopi Gopalakrishnan discusses the use of technology to respond to the COVID-19 emergency. The sudden lockdown imposed by the government with just four hours' notice resulted in a paralysis of the healthcare system. World Health Partners (WHP) responded immediately to this crisis. WHP worked in partnership with the state governments of Bihar and Andhra Pradesh. The plan was that the state governments would provide the personnel and WHP would set up a digitized system for providing health services to the people by using tele-medicine.

A quick-to-access dashboard was created to give details in real time of the number of doctors and assistants who were logged in, the number of calls received and was attended to, prescriptions issued, and COVID-19 suspects identified. Doctors' absenteeism proved to be a challenge in Bihar. Consequently, the full potential of the project could not be realized in Bihar. In Andhra Pradesh, however, the project was very successful. Despite receiving less number of calls, more consultations were provided through tele-medicine project in Andhra Pradesh. The major reason for this success was the high level of political commitment by the state government which led

to the availability of trained medical personnel for the project. The entire process of the project was successfully transitioned by WHP to the state government of Andhra Pradesh.

Unveiling the Clinical Face of COVID-19

Arti Singh and Ashutosh Singh discuss the clinical aspects of COVID-19. A picture of what happens in a hospital—the ward and the intensive care unit (ICU)—is described. The impact of the disease on patients, healthcare professionals, and hospital management is discussed. Case studies are provided of patients who recovered as well as those who did not. The lived experience of all these individuals is portrayed.

Arti Singh presents her own lived experience over the ten-month period of the pandemic. She describes her experience as well as that of her team from the inception—when the pandemic began. She traces changes made to date to diagnose and treat COVID-19 patients in the months that followed. Patient treatment and management regimens were refined and streamlined over time. And the health system was redesigned to cope with the influx of huge numbers of COVID-19 patients into the hospitals. During this time, diagnostic tools and treatment regimens evolved. Doctors and their teams of nurses and technicians worked tirelessly day and night to cope with the onslaught. The public, however, stigmatized healthcare workers as it was overcome with the fear of getting infected.

Ten months ago, the medical profession knew very little about the virus or the disease as both were new. But with its dedication and commitment, the medical fraternity managed to cope with the rising number of patients with whatever tools it had. The past ten months witnessed a rapid learning curve.

The Twin Epidemics: TB and COVID-19 in India

Chappal Mehra discusses the twin epidemics of COVID-19 and tuberculosis (TB) in India. He argues that COVID-19 has disrupted the health systems in low- and middle-income countries and has consequently unleashed a global health crisis. The lack of preparedness is visible at multiple levels of the healthcare system in India. The health system is overwhelmed by the influx of COVID-19 cases, dislodging all other patients. An inadequate healthcare infrastructure with less than optimal human resources along with a rising caseload and serious supply chain disruptions has resulted in fatigue, frustration, and anger among the health work force, on the one hand, and an atmosphere of fear among the patients and healthcare workers, on the other.

The media is filled with messages on the COVID-19 crisis. Forgotten in the hyperbole is that numerous other diseases continue to devastate India's population. Of these, the most important is TB. India continues to bear the highest burden of TB

in the world accounting for estimated 2.8 million cases every year and killing more than 400,000 persons annually. TB kills 1200 Indians every day.

The symptoms of COVID-19 and TB are very similar. Both are respiratory airborne diseases. Both diseases are heavily stigmatized. And both are associated with mental health problems. Gender disparities are apparent in TB and COVID-19, but the gendered aspects of these diseases are ignored in programming. The author argues that for all these reasons, these two diseases should be addressed in tandem. It is time to fight COVID-19 and TB just as it is time to invest in public health.

Ensuring the Continuity of Sexual Reproductive Health and Family Planning Services During the COVID-19 Pandemic: Experiences and Lessons from the Women's Integrated Sexual Health Program

One of the main aims of the UK-aid funded Women's Integrated Sexual Health (WISH2ACTION-W2A) program is to strengthen government stewardship of sexual and reproductive health/family planning (SRH/FP) services across seven countries in South Asia and Sub-Saharan Africa. Options Consultancy provides technical assistance within four work streams: (1) creation of a favorable policy and planning environment; (2) improved public sector investment; (3) national stewardship over quality improvement; and (4) establishment of accountability systems to influence and track commitments and policies. This role became even more important since the coronavirus disease 2019 (COVID-19) outbreak shifted government's priorities to the COVID response and led to the disruption in the delivery of essential health services, threatening to undo and reverse the SRH/FP gains made to date. The experiences in engaging governments to ensure that access to SRH/FP remains a priority and enabling environment is maintained are discussed by the authors. The authors draw out wider lessons on the range of actions that can be taken at policy and systems level to protect SRH/FP during a health emergency in different country contexts, including the severity of the outbreak, sociopolitical environment, and health systems preparedness. The authors also highlight how the pandemic can provide new policy opportunities, such as to accelerate self-care and strengthen health systems resilience.

COVID-19 Vaccine Development and Administration in India

Drishya Pathak and Philo Magdalene examine, in great detail, issues related to vaccine development, production, and distribution in India. They discuss the problems related to logistics for the distribution of vaccines to India's large population. The role of international organizations engaged in vaccine development, procurement, and distribution is also examined.

The development of vaccines for COVID-19 within a ten-month period has been an extraordinary achievement given that in the past it has taken 10–15 years to develop a vaccine. Five vaccine candidates are in different stages of development in India.

India's robust capacity for developing vaccines is globally acknowledged. India has also had a long history in organizing and implementing immunization programs for pregnant women and children. However, organizing a national vaccination program for COVID-19 is challenging because of India's large population and fragile health infrastructure.

India rolled out the COVID-19 vaccination program in January 2021. The state governments have developed plans for the storage and distribution of vaccines and for the implementation of the vaccination program. Important elements within the program are communications and advocacy which aim to inform the people about the vaccine and its benefits and to encourage them to get vaccinated so that the problem of vaccine hesitancy, a major deterrent, can be prevented.

India and the world are at a critical juncture in the history of the pandemic where the availability of vaccines shows a glimmer of hope—a light at the end of a dark tunnel.

The Impact of COVID-19 on Mental Health, Nutrition and Hunger, Sexual and Reproductive Health and Rights, Family Planning, Gender, and Health Financing

The COVID-19 pandemic affected multifarious health dimensions. Since attention and resources were deflected for treatment of COVID-19 cases, all other health services were adversely impacted. This, in turn, impacted mental health, nutrition, sexual and reproductive health, gender, and health financing.

A Lifestyle Disorder that Spared Nobody: Mental Health and COVID-19

Komal Mittal and co-authors discuss the mental health problems that emerged during the COVID-19 pandemic. Mental health has manifested as a lifestyle disorder that is being experienced by everybody all around the world. The authors discuss a range of mental health problems due to COVID-19. Their prevalence and implications are assessed. In order to provide perspective, publications from India and other countries are cited. The causes and consequences of mental health problems associated with COVID-19 are analyzed by the authors.

In India, mental health problems were on the rise even before the pandemic. The pandemic, however, greatly exacerbated these problems. Stress, anxiety, and depression became a part of everyone's life. No one was spared. Strong public health

measures to contain the pandemic including the prohibition of movement and isolation took their toll. Being away from work, school, and peers, adjusting to new ways of working and learning, and dealing with job loss were all stressful. Fake news and miscommunication further fueled the problem.

A large section of the population was forced to reinvent its workplace, often in unfavorable environments, resulting in a deep sense of unease. Research shows that because of uncertainties related to finances, work pressure, and jobs, there was a rise in the number of cases of mental illness. The number of suicides also increased. Research in India and other countries underscores that COVID-19 has compounded all these problems. Stringent public health measures imposed by all governments, although necessary for containing the pandemic, has had a major impact on the psychological state of the people. Fear, anxiety, and anger are some of the psychological consequences. Anxiety producing information in the media, often incorrect, accentuated these problems.

Preoccupation with the pandemic resulted in a neglect of the mental well-being of the patients, healthcare professionals, and frontline workers. This caused psychological distress that varied from panic attacks and collective hysteria to pervasive feelings of hopelessness and desperation including suicidal behavior. The psychological wellness of individuals was influenced unfavorably by lifestyle changes caused by the pandemic that included isolation, limited mobility, social stigma, ever-spreading misinformation, and fake news on Web-based platforms.

Violence against women and girls also increased during the pandemic. Increased violence was perpetuated not only inside the home, but also in other spaces. Migrant workers, health workers, and sex workers were seriously impacted. The authors underscore the urgent need for setting up hotlines, crises centers, shelters, legal aid, and counseling services.

The pandemic might be the much-needed wake-up call to make long-term improvements in India's healthcare system. It offers an opportunity for India to take greater cognizance of mental health problems and to integrate services for addressing these problems within the primary healthcare system.

Malnutrition and COVID-19 in India

Shweta Khandelwal argues that while the world is battling, the new coronavirus known as SARS-COV-2, public health and nutrition services in India are getting disrupted and derailed. It is pertinent not to overlook the other existing gaps in our journey toward attaining the holistic Sustainable Development Goals (SDGs). In fact, it is now well established that comorbidities, especially malnutrition, diabetes, cardiovascular diseases, and other respiratory or kidney problems, exacerbate pathogenesis of COVID-19 because of an already compromised immune system. The whole world is off track in achieving SDG 2, known as Zero Hunger by 2030. At the current pace, approximately 17 countries including India will fail to even reach low hunger by 2030. India ranks 104 out of 117 countries as per the used metric, the

global hunger index. Furthermore, these projections do not account for the impact of the COVID-19 pandemic, which may worsen hunger and undernutrition in the near term and affect countries' trajectories into the future.

The author underscores the serious adverse impact of COVID-19 on public health, nutrition, and food security in India and other low- and middle-income countries. Estimates show that 135 million persons were hungry before the pandemic. By the end of 2020, the number will likely increase to 265 million. India carries a heavy burden of multiple forms of malnutrition including undernutrition, hunger, micronutrient deficiencies as well as overweight–obesity. The author suggests that public health and nutritional policies must urgently address these problems. She outlines the measures taken by the government during the pandemic to counter its negative impacts on the nutrition of women, children, migrant labor, and other vulnerable populations. The response of the international community to tackle COVID-19-related nutritional challenges and India's policy measures for ensuring nutrition and food security are discussed.

Sexual and Reproductive Health of Adolescents and Young People in India: The Missing Links During and Beyond a Pandemic

Sapna Kedia and co-authors discuss the impact of the pandemic on the sexual and reproductive health of adolescents and young people. Adolescents and young adults (AYA) are at low risk from COVID-19, and hence, their needs may be assumed not to warrant immediate attention. However, it is important to understand how the pandemic may have affected their lives. Evidence from previous humanitarian disasters in India and elsewhere suggests that consequences for adolescents and young adults may be significant and multi-dimensional. The authors examine the impact (short and long term) of COVID-19 on the sexual and reproductive needs and behaviors of AYA in India, particularly their intimate relationships, sexual violence, access to services, and impact on their mental health.

Programs for AYA should be responsive to their needs, feelings, and experiences and should treat them with the respect they deserve, acknowledging their potential to be part of the solution, so that their life condition improves and the adverse impact of the pandemic is minimized. Programs must also address the needs of vulnerable AYA like migrants, those from the lesbian, gay, bisexual, transgender, and queer (LGBTQ) community and persons with special needs, HIV-positive youth, and those who live in poverty. It is important to understand how gender impacts the sexual and reproductive health of AYA, of young girls and women, in terms of restriction and mobility, increase in dependence on male partners/friends/relatives, gender-based violence, control of sexuality, and the lack of privacy and confidentiality. The responses to these needs by youth-based and youth-serving organizations and the government

are summarized. Recommendations are made to address the prevailing gaps from a sexual and reproductive health rights and social justice perspective.

Family Planning in India During the COVID-19 Pandemic

Sanghamitra Singh and Poonam Muttreja discuss the profound impact of the pandemic on women's access to family planning services. They show how the interruption in the provision of reproductive health services resulted in a lack of access to contraceptives and consequent unplanned pregnancies and abortions. Unmet need for contraception increased while maternity care and immunization decreased. This resulted in an increase in unwanted pregnancies as well as maternal mortality and morbidity.

The COVID-19 crisis set back progress made in health services over the past decades. This was significant in the case of reproductive health programs. These programs were adversely affected because financial and manpower resources were diverted to services for COVID-19 patients. The authors provide estimates of the impact of the non-availability of sexual and reproductive health services on women. Suggestions are offered for mitigating the impact of COVID-19 on these health services.

Gender Insights into a Unique Threat to Human Development

Drawing from both primary and secondary data, Madhu Bala Nath examines the gender dimensions of the pandemic. While maintaining a focus on health, she discusses the linkages of health, poverty, and women's agency. The COVID-19 pandemic has impacted the human development index that incorporates literacy, income, and life expectancy.

COVID-19 has severely impacted women's reproductive health. Unintended pregnancies, abortions, and maternal mortality have increased as a consequence of the pandemic. The demand for services, especially nutritional services, child immunizations, and family planning services, was not met. Sexual and gender-based violence increased during the pandemic. Mental health problems also increased. All these problems affected women disproportionately. The impact of stigma on women's health is discussed. Its effect on LGBT communities is underscored. The suicide rate in India was higher than that in other countries in South-East Asia even before the pandemic, but COVID-19 exacerbated this problem.

The author suggests that the government should support disadvantaged communities including the LGBTQ community by transferring leased assets as an eligible collateral for working capital loans. Relief packages for COVID-19 should be reworked so they are gender responsive.

COVID-19 is threatening the gains made by India to increase women's education, livelihood opportunities, and labor force participation. It is also affecting women's physical and mental health. The author makes a plea for strengthening women's agency, a critical imperative for countering these problems.

Financing for a Resilient Health System in India: Lessons from the COVID Pandemic

Indrani Gupta discusses the issue of health financing. COVID-19 has brought into focus the urgent need for building resilient health systems that can cater efficiently and equitably to the population during normal times as well as during unforeseen events like an epidemic, pandemic, or other unanticipated events that impact human health. To be prepared well in advance means to avoid unnecessary morbidity and mortality on the one hand, and to minimize socioeconomic impact on individuals and households, on the other. The author argues that each component that goes into building a resilient health system requires financing, making health financing the key policy knob for the government. A review of the pandemic situation and the country's response shows that India has had to struggle in real time to fill the various gaps in the health system during the pandemic, by making emergency investments on a variety of essential goods and services for the health sector. A brief analysis of key health system parameters is done as a situational assessment to emphasize the importance of adequate health finances. The author analysis the trends in out-of-pocket expenditure and government investment on health up until the latest 2021–22 budget announcement was made to understand how and to what extent the government prioritized health investments, especially when compared to other countries in a similar economic situation. Finally, the latest budget outlays for health are examined to analyze whether India has been able to use the pandemic as a wake-up call for prioritizing the health sector and building a stronger health system.

The Impact of COVID-19 on Vulnerable Populations

COVID-19 disproportionately impacted the lives and livelihoods of vulnerable populations. The situation of interstate migrant laborers and female sex workers, who were hardest hit by the pandemic, is discussed.

'I Just Want to Go Home': What the Lockdown Meant for India's Interstate Migrant Workers

Philo Magdalene and co-authors provide a commentary on the interstate migrant exodus that took place after the government imposed the national lockdown to control the transmission of COVID-19 infection. The lives of the interstate migrant workers were seriously disrupted when the national lockdown was imposed. The authors bring into focus the inequalities of our times that resulted in serious human right violations. Migrant laborers were the hardest hit during the pandemic. Migrants and their families were pushed to starvation, deprivation, and destitution. The authors study this problem from a rights-based perspective.

The unprecedented lockdown resulted in a migrant frenzy. Millions of interstate migrants, stripped off their livelihood, were forced to flood the roads across the country in the last desperate bid to return home to their villages. Many chose to walk for weeks and weeks covering thousands of miles in their desperation to get home.

The authors discuss the horror that migrants faced as they went through their journey. The nightmare that ensued was a severe violation of human rights. Bedraggled, starved, and exhausted, the exploitation and hardship that they endured along with their families continued over time.

The migrant crisis not only hit the headlines in India but also drew the attention of world media.

From Vulnerability to Resilience: Sex Workers Fight COVID-19

Sushena Raza Paul and co-authors describe the plight of sex workers, a particularly disadvantaged community that is highly marginalized and vulnerable. Sex workers were hard hit by the pandemic. The authors examine the impact of COVID-19 on sex workers' lives and livelihoods, their response to the crisis, and the strategies that they employed to battle the pandemic.

During the lockdown, female sex workers lost their livelihoods which plunged them and their families into extreme poverty. Even when unlock measures were announced, the business of sex work did not return to normal. Sex work, by its very nature, demands physical proximity—not physical distancing. Consequently, sex workers had to innovate to find work to survive. Loss of livelihoods also brought to the fore hidden mental health problems. Gripped by anxiety and depression due to the uncertainty about when the pandemic would end, sex workers went into despair. Some even attempted suicide. Violence in the family increased significantly. For sex workers living with HIV, there was the added anxiety about the continuation of antiretroviral therapy (ART). Community-based organizations (CBOs) took on the responsibility of providing drugs to sex workers by developing a unique supply

chain. The CBO members collected the drugs from the health centers and delivered them to sex workers at a mutually convenient place, thereby ensuring confidentiality.

The authors draw attention to sex workers who are invisible in most discourses. This vulnerable, marginalized community was seriously affected by the pandemic. Sex workers were victims but were also the first responders to the pandemic. Sex worker collectives formed to fight HIV were by their very nature well equipped to fight the COVID-19 pandemic.

The government's announcement to provide rations to the poor was a welcome move, but it was not of much help to sex workers as they did not possess ration cards. The sex worker collectives valiantly fought this battle and won. The Supreme Court of India directed the states to provide sex workers with dry rations without insisting on any proof.

The stories of the lives and resilience of sex workers, narrated in this chapter, are inspiring. The authors discuss the plight of female sex workers during the COVID-19 pandemic. The community of sex workers was missing from all government policies and welfare schemes. The sudden lockdown robbed them of their livelihoods. Basic necessities like food and shelter became illusive. The authors portray the stories of the struggles of sex workers from different parts of the country. They discuss how despite uncertainty, stigma, and loss of livelihoods, sex workers emerged strong. The resilient spirit of sex workers should be celebrated. The stories of sex workers have a common thread of resilience, resourcefulness, grit, and determination in the face of unsurmountable challenges.

Changing Role of Media and Communications in the COVID Era

Media and communications played a significant role in providing information to the people. Communications to change behaviors to prevent the transmission of infection were an important intervention. The adverse impact of miscommunication and fake news was a serious problem during the pandemic. These issues are discussed by the authors.

Communicating COVID: Learnings and Way Forward

Nandita Suneja and Kaushik Bose underscore the importance of five key components of a successful pandemic communication strategy—trust, timeliness, transparency, public, and planning. The authors state that the rapid dissemination of information in social media and other digital platforms has led to an overabundance of information about COVID-19 and much of it is false. This has been termed by the World Health Organization (WHO) as an 'infodemic.' Misinformation and disinformation

about the origins of the pandemic, how it spread, and how it can be contained, have adversely impacted efforts to save lives. However, several international and national organizations have successfully countered these messages by using low-tech and high-tech technologies to build trust and encourage compliance with public health measures. Drawing on past experiences with previous pandemics, the authors discuss how communication strategies have been refined over time. Examples are provided of the impact of misinformation and disinformation on the pandemic in different countries. The experiences of countries around the world as well as that of India are analyzed.

Based on learnings with various communication approaches, the authors make recommendations for future crises: trust the science, identify credible spokespersons, consistently relay and leverage technologies, invest in digital literacy, sustain media engagement, and build inter-sectoral cooperation.

Relevance of Social and Behavior Change and Communications in the Media on COVID-19 Response

Sanghamitra and colleagues discuss the important role of social and behavior change and communication strategies in the prevention of infection. These strategies have two complementary, albeit distinct roles: (1) Educate citizens on the health risks of COVID-19; and (2) promote desired behaviors to prevent infection.

The authors believe that messages for the prevention of COVID-19 should be clear and consistent and should be based on scientific evidence. These messages need to be reinforced to promote positive behavior change. They should be empathetic and inclusive and should counter misinformation and fake news. Government of India's citizen engagement platform 'MyGov' has rolled out a series of campaigns for the prevention of COVID-19. Civil society organizations have complemented the official campaign. The Population Foundation of India developed the *Corona Ki Adalat* (the court of corona) animation series to disseminate key messages and reinforce a sense of solidarity around the fight against COVID-19.

India and the world have, for the first time, witnessed an amalgamation of science and mainstream media. The collaboration of the media and public health workers and doctors has been commendable. The authors illustrate this with examples of personalities who stepped up and gave their time to the media to convey important messages to the public. The last few months have truly witnessed the power of the media and behavior change communication efforts. Until a vaccine is widely available, the only way to protect people from COVID-19 and to minimize the burden it places on the public health system is to promote widespread behavior change. And this can only happen through the collaborative efforts of the government, media, public health experts, and civil society organizations.

Experiences of Countries that Have Successfully Contained the Pandemic

Countries that have implemented programs that have been effective in containing the pandemic can provide lessons for those that are still struggling to bring down the number of COVID-19 cases. The authors have analyzed the strategies that were employed by these countries to draw learnings that could be useful globally and in India.

'Go Ahead, Go Early': New Zealand's COVID-19 Elimination Strategy

Rashmi Pachauri Rajan describes how New Zealand successfully eliminated the virus. 'Go ahead, Go early' was New Zealand's moto. Strict border controls and high compliance with lockdown measures proved to be effective in controlling the pandemic.

New Zealand's official campaign 'Unite Against COVID-19' was later changed to 'Unite for Recovery' as the focus shifted from elimination to recovery. It has now changed back to 'Unite for Recovery,' and this will remain until the international threat of COVID-19 is eliminated.

The strategy was guided by science and data. The government followed public health advice and evolving evidence. And, of course, leadership played a crucial role. The Prime Minister was resolute, confident, and pragmatic. The messages she reiterated at the daily press conferences became catch phrases. Discipline came to the fore. People did not complain. They did not protest. They simply followed the rules, placing utmost trust in their government and its clear communications. Trust in political leaders and health experts was the key reason for the success of the program. And kindness was the *Mantra!*

Amid the gloom and doom that our world is currently battling, God was spotted in New Zealand. Someone asked God 'What are you doing?' 'Working from home, Bro.'

Learnings from Asia

Saroj Pachauri and Ash Pachauri draw learnings from Asia by examining the strategies employed by governments in countries that have successfully contained the pandemic. They study the policies and strategies undertaken in Taiwan, South Korea, Vietnam, Singapore, East Timor, and Mongolia, countries that have successfully countered the ravages of COVID-19.

Rapid response to the pandemic by strong leaders who used evidence-based strategies, forged partnerships to build a sustainable program, and provided transparent communication is discussed. The leaders of these countries acted decisively in the COVID-19 response with a whole of government approach. The presence of robust public health systems along with national institutions that can act swiftly to prevent the spread of infection was an essential prerequisite for containing the pandemic. The process of enforcing top-down programs was shifted to a multi-stakeholder, participatory approach. Strong and compassionate leadership was undoubtedly the defining trait of nations to navigate time-sensitive issues in today's pandemic era. Their experiences showed that policies that addressed equity issues and were compatible with the cultural context had a more enduring impact. In countries, where large numbers of infections are still being reported, it is time that leaders acknowledge the importance of acting rapidly on the best available evidence, with transparency and responsibility that is particularly critical in low-income, fragile settings.

The Research Imperative

The magnitude of the health and economic impact of COVID-19 in India and the world is still unfolding as cases are increasing. While the Government of India was compelled to take drastic measures for the management of COVID-19, forecasts predict a plunge in India's GDP growth to the extent of 3.3% compared to estimations prior to the COVID-19 outbreak. As a low–middle-income country, the challenge of fiscal responsibility on the growing demand of medical supplies added to the already low public expenditure on health is a major concern. The global slowdown in production and supply might have far-reaching consequences for the Indian pharmaceutical industry, notably an essential driver of the Indian economy and its capacity to produce preventive or therapeutic medical products crucial to the Indian and global response in tackling COVID-19.

As we attempt to identify the profound challenges and potential fallouts of COVID-19 in India, we must address the paucity of research regarding the health dimensions of the pandemic and investigate how responses can be devised and how research priorities require us to embrace complexity by deploying multi-dimensional perspectives. Authored by experts in the field, this book is a compilation of perspectives on the important health dimensions of COVID-19, lessons learned, and future directions and strategies for mitigating and managing risks in a pandemic era.

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Part I
Responding to the Impact of COVID-19 On Health Service Delivery

Chapter 2
Investing in a Resilient and Responsive Healthcare System During COVID-19 Pandemic

Bulbul Sood

Abstract Strategies implemented by Jhpiego nationally and in 15 states of India to respond to the COVID- 19 emergency and to counter the devastating impact of the pandemic are discussed. By the time the nationwide lockdown was imposed in March, 2020, Jhpiego's COVID-19 response strategy was in action. This strategy included strengthening the capacity of the health workforce, supporting the national and the state governments, and ensuring the continuation of essential health services including reproductive health services.

Jhpiego mounted a swift multi-sectoral and multi-pronged program to provide technical support for enhancing the preparedness of the healthcare system across 15 states. Training and monitoring activities were conducted using virtual platforms. A decentralized approach was employed to co-design with the community local solutions for health problems. The thrust was on developing community-centered, community-owned, and community-driven programs. Digital technology, including tele-medicine and other innovative solutions, played a key part in these efforts. The program provided technical assistance for building a resilient healthcare system by strengthening governance mechanisms and facility-based preparedness, piloting an integrated disease surveillance system, enhancing the use of data to guide evidence-based decision-making, re-designing public health facilities, and setting-up rapid response teams which could be quickly mobilized to respond to crises.

Introduction

The COVID-19 pandemic has burdened the healthcare system immensely globally and in India. The number of cases has crossed the eight million mark within eight months since the first case was reported in India on January 31, 2020 [1]. The disease outbreak has placed unprecedented demands on the healthcare system. With a population of 1.3 billion, varying levels of health system preparedness across states and

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union territories, and densely populated settlements of the urban poor with limited access to water and sanitation services, India is particularly at high risk [2].

As the pandemic began to spread in India, the immediate need for international not-for-profit organizations like Jhpiego was to step in and support the government at the national and state levels with innovative strategies, technical assistance, and field-based support to deal with this public health emergency. Jhpiego, a global health leader and a Johns Hopkins University affiliate, has been working in several countries including India to save lives, improve health, and transform the futures of millions of women and their families. It stepped in to provide multipronged support to the national government and more than 15 state governments to fight the pandemic.

By the time the lockdown started in India in March 2020, Jhpiego's COVID-19 response strategy was in action. It started with three clear objectives: (1) Strengthen the knowledge and expertise of frontline health workers to deal with COVID-19; (2) support the national and state governments in their requests for COVID-19 response; and (3) ensure continuation of reproductive, maternal, newborn, child, and adolescent health services, and other essential health services.

In the early days of the pandemic, there was limited understanding about the modes of transmission of the infection. Jhpiego prepared and disseminated learning resource packages and risk communication material. To help with the continuation of essential services, virtual trainings were organized to cover facility preparedness, infection prevention, and triaging. The training material was freely shared with the National Disaster Management Authority, the Indian Nursing Council, state governments, and NGOs. Jhpiego helped government staff to interpret state-specific guidance, and it developed frequently asked questions (FAQs) and incorporated strategies to address mental health problems.

Jhpiego worked closely with various state governments to provide a rapid response to COVID-19-related needs which included mapping of essential supplies of personal protection equipment, masks, and ventilators, enabling rapid procurement of these items, and supporting state governments to assess district preparedness for quarantine and isolation facilities/wards at district hospitals for containing the highly contagious novel coronavirus.

In keeping with its mission of saving women's and children's lives, Jhpiego teams placed a special emphasis on ensuring that quality care was available to pregnant, laboring, and breastfeeding women. It continued to work closely with frontline healthcare workers helping them as they conducted home-based antenatal and post-natal care and provided contraceptives. Jhpiego also participated in efforts to enable continuity of care for non-communicable diseases like diabetes in pregnancy and cancer care. In some states, Jhpiego staff assisted the maternal health division to organize and operationalize maternity care services in COVID hospitals.

By mid-October, more than 50,000 people were reached through some 200 virtual training sessions across 15 states. The orientations and trainings included various cadres of health workers including doctors, nurses, paramedical staff, community-level workers, volunteers, district and state officials, tele-counselors, hospital owners, academic counselors, and even civil defense staff.

In the following sections, innovations in Jhpiego's COVID-19 response that provided timely and critical support to national and state governments are shared.

Jhpiego's Innovative COVID-19 Response Through NISHTHA

Jhpiego is the implementing partner for US Agency for International Development's (USAID's) flagship health systems strengthening program called NISHTHA. This program aims to transform primary health care (PHC) in India so that it is equitable, comprehensive, and client-centered, and improves health outcomes for India's marginalized and vulnerable populations. A well-resourced and well-equipped resilient primary healthcare system is needed to manage COVID-19 and other public health threats. Jhpiego was fortunate to have been working at the national level and in 13 intervention states—Assam, Chhattisgarh, Jharkhand, Madhya Pradesh, Odisha, Arunachal Pradesh, Maharashtra, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura and so could quickly move in to provide technical assistance to strengthen the COVID-19 response. Technical assistance was planned in two phases: (1) an acute phase to address the immediate requirements and needs articulated at the national and state levels for mitigation and health system preparedness and (2) resilience and recovery phase which focuses on technical assistance to the national and state governments to gear up the primary healthcare system for resilience and enhance preparedness for COVID-19 and other infectious diseases and future public health emergencies.

> NISHTHA's training came at the right time. It was beneficial in many ways as at that time there was a lot of misinformation and chaos. The virtual training helped build capacity, dispel myths and misconceptions, and equip Jhpiego with the right knowledge.
>
> Ms. Chetna Sharma, Community Health Officer, HWC Sagod, Madhya Pradesh

Key Strategic Projects Under NISHTHA for COVID-19 Response

The Jhpiego teams moved quickly to implement the following innovative solutions in partnership with state governments, to address COVID-19-related challenges, maintain essential health service delivery, and prevent health system collapse.

Data-Driven Intelligence Support for COVID-19 in Maharashtra

Intervention Rationale

Strengthening the response to the COVID-19 pandemic depends largely on continuous and close monitoring of the actual on-the-ground situation and outcomes of interventions to mitigate the risk of infection. Responding to public health emergencies like COVID-19 requires timely and accurate information on the number of cases, preparedness of healthcare facilities, and the availability of a health workforce. COVID-19 has reinforced the importance and need for data-driven solutions for infection control. System responsiveness had to be intensified to deal with the current pandemic. Challenges like lack of personal protection equipment (PPE), testing kits, isolation beds, intensive care units (ICUs), and medical oxygen had to be addressed [3, 4].

Tools like mathematical modeling of the disease can help in the estimation of healthcare requirements and enable a logical allocation of resources. Considering the varied spread of the virus in different cities, planning for mounting a response had to be adaptable and situation-specific. When the case numbers are relatively few, a mathematical simulation approach is best suited to understanding the epidemic and formulating an appropriate response [5, 6]. Several data repositories, along with mathematical models, have been developed overtime for academic and research purposes to predict the extent and duration of various infections [7]. However, the current pandemic situation has seen a steep increase in the use of mathematical models to analyze and predict the outbreak for planning an effective public health response.

Model Description

In order to strengthen the COVID-19 response in the state of Maharashtra, Jhpiego's team, in partnership with its technology partner Gramener and in consultation with the state government, designed a COVID-19 data-driven intelligence engine and a citizen's mobile application.

The intelligence engine is a combination of a comprehensive COVID-19 dashboard that provides data of the ground situation of COVID-19 and predictive modeling which forecasts the COVID-19 situation for a period of 14 days (Fig. 2.1a, b). The dashboard includes a summary of the overall picture of COVID-19 in the state including geographical distribution of cases across the state, cases across different segments of the population, and availability of testing capacities and medical supplies. Interactive data visualization enables policy-makers to view the trends and statistics at a glance and make evidence-based decisions on the preparedness of healthcare facilities, areas for rigorous testing, and other preventive measures. A

Fig. 2.1 **a**, **b** Snapshot of COVID-19 data dashboard and predictive model, Government of Maharashtra. *Source* District Health Survey (DHS) COVID-19 data dashboard

subset of this dashboard is available for the general public to keep them updated on the current status of COVID-19 in the state and the health preparedness initiatives undertaken by the state government. To meet future demands on the health infrastructure, a predictive modeling dashboard was created to forecast the number of cases, the number of health facilities, and medical supplies required for an integrated response. The objective is to provide evidence for guiding policy decisions on COVID-19 and the response of government officials in the state. This modeling exercise forecasts up to 14-day projections for cases, recoveries, and deaths. Additionally, infrastructure (number of isolation beds with and without oxygen support and critical care beds) and logistic requirements (PPE kits, N95 masks, and medical
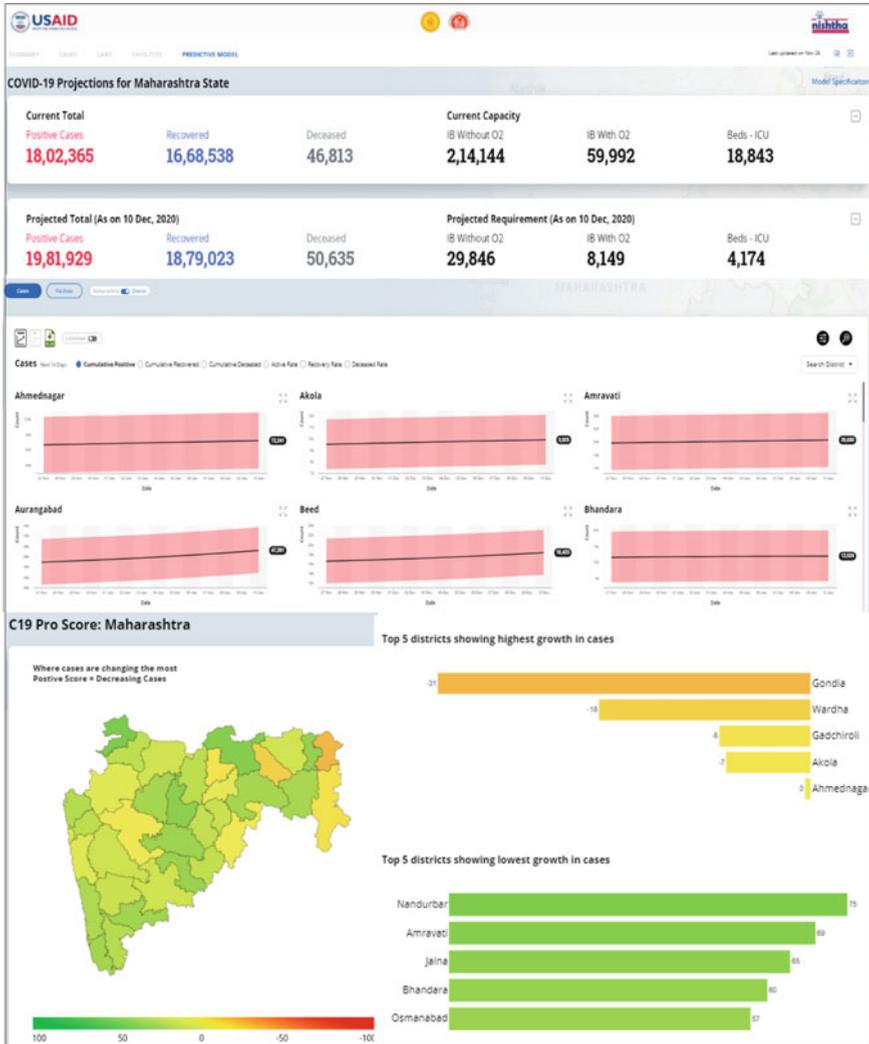
Fig. 2.1 (continued)

oxygen) are also projected to assist in the preparations for tackling the impact of the disease on the health infrastructure. The model forecasts the number of COVID-19 cases using a combination of a polynomial regression (subset of machine learning) and composite scoring. Composite scoring combines the output best fit for the polynomial regression model and adjusts the projections to the additional independent parameters influencing the outcome of COVID-19. An additional element is built into the model called COVID-19 pro-scoring accounts for changes in the number of

cases by considering a 7-day moving average of the change in rate. The data dashboard is customized to give a multi-dimensional picture of COVID-19 across all 36 districts in the state of Maharashtra.

With enumerable options to navigate through the analysis, policy-makers have the freedom to simulate the model by changing certain input parameters. This is crucial as decision-makers can make quick inferences from the simulation and use them for taking important decisions on opening up key aspects of the economy.

Maha Swasthya *Citizens' Application*

A citizen's mobile application, *Maha Swasthya,* was designed to provide real-time information to the public on COVID-19 hot spots, testing, and treatment. Through this multilingual application, people can access information on each health facility including the number of available beds and ventilators as well as contact details of the key nodal officer and the health facility. The mobile application also provides advisories on COVID-19 and an option wherein people can self-assess. It helps them to identify the severity of the COVID-19 infection based on which they can take timely decisions for availing health services (Fig. 2.2).

Outcome Insights

Prompt development of data analytics through digital interventions helped decision-makers monitor the impact of the pandemic in real time in the large state of Maharashtra. This tool was effectively used for monitoring the progression of the disease. It tremendously reduced data ambiguity across all levels in the decision-making chain. The forecasting tool also enabled state officials to ensure availability of necessary infrastructure and logistics in all the districts. Although forecasting was done for a shorter duration, given its precision, districts found it to be very useful for undertaking planning and preparedness activities for the immediate duration. Multiple methods were adopted by the state to disseminate the findings from the dashboard to the districts.

Fig. 2.2 Snapshot of the mobile application *Maha Swasthya*
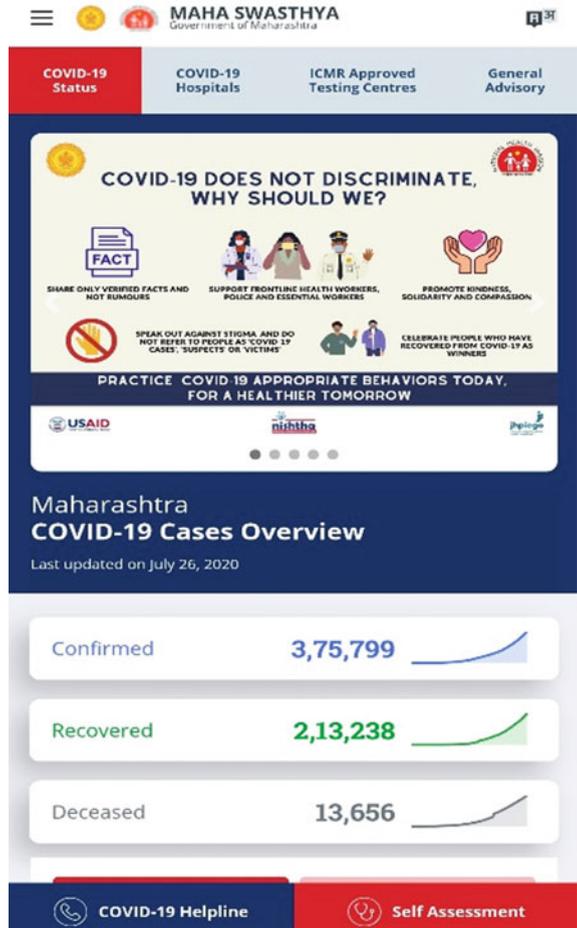
Alternate Platform for Risk Communication and Community Engagement: NISHTHA *Swasthya Vaani*

Intervention Rationale

The COVID-19 pandemic has brought in various unprecedented challenges to communities and marginalized people across India. Widespread outbreaks of COVID-19 are associated with psychological distress and mental health problems due to the loss of livelihoods, and financial insecurity among vulnerable populations. The physiological feeling of fear of infection, somatic concerns, and worries about the pandemic's consequences is compounded by the risk of adverse mental health consequences, especially in migrants crossing borders to reach their home states.
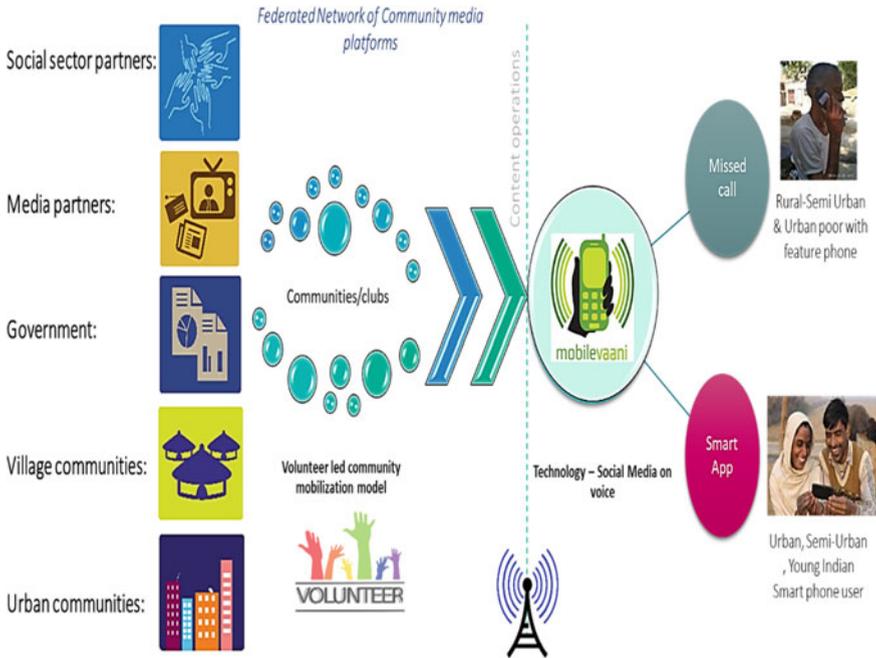
Fig. 2.3 NISHTHA *Swasthya Vaani*

Other psychiatric problems like alcoholism and substance abuse, and risky behaviors such as violence related to gender, children, and youth will likely increase in the coming months. Given the lockdown situation and physical distancing norms, many vulnerable groups (migrant workers, the elderly, and persons with disabilities) were not able to access information related to the COVID-19 situation (Fig. 2.3).

Model Description

To support vulnerable communities during COVID-19, with the help of a technology partner GramVaani, Jhpiego set up a communication platform to reach the target population through an alternate medium—the interactive voice response (IVR)-based system called NISHTHA *Swasthya Vaani* and linked it with appropriate care through a network of local partners. Through this intervention, risk communication messages were disseminated to vulnerable populations including migrant workers and their families, the elderly, persons with disabilities, the urban poor, and people living in remote areas, on COVID-19 preventive measures including hand-washing, treatment-seeking, countering misinformation, and social distancing. The messaging focused on mental health issues, care of the elderly, persons with disabilities, and information on relief measures and social protection schemes. Over time, it is intended that

messaging will focus on information on health services for reproductive, maternal, newborn, child health, and adolescent health (RMNCH+A), tuberculosis (TB), and other health services provided by health and wellness centers (HWCs).

This is a community-led model, wherein community-level volunteers are identified from the field who mobilize the community to utilize this platform for obtaining knowledge and also for recording their grievances. The specific work includes increasing community awareness through risk communication messaging through IVR, a mobile-based application, coordinating relief measures, and ensuring social accountability. A dedicated response system reinforces information through local influencers including *Panchayati Raj Institution* (PRI) members, self-help groups (SHGs), and other local leaders. The intervention was implemented in five districts of two states—four in Madhya Pradesh (Guna, Rajgarh, Khandwa, and Barwani) and one in Jharkhand (Ranchi).

Outcome Insights

NISHTHA *Swasthya Vaani* quickly penetrated the project geographies spreading awareness on COVID-appropriate behaviors and helping people to share their day-to-day grievances. These grievances are promptly addressed by the field volunteers with the help of the local government. This technology, based on a two-way communication process, has become very popular among the target users. By October 2020, 47,249 calls were sent out and 15,753 unique users were identified through the intervention in five districts of Madhya Pradesh and one in Jharkhand.

Provision of Tele-medicine Services Across Health and Wellness Centers in Nagaland

Intervention Rationale

The COVID-19 pandemic has brought in many unprecedented challenges to the health system including the disruption of routine healthcare services. Under lockdown, travel was restricted and fear of contacting infection resulted in people not accessing health facilities for their routine health checkups. Also, as per the Government of India's advisory, very mild/asymptomatic patients who had requisite facilities at home for self-isolation were provided the option of home isolation. COVID-19 also disrupted the continuity of essential services and limited triaging facilities to identify and refer COVID-19 patients to the primary healthcare level. This resulted in a high caseload at secondary- and tertiary-level facilities. There was a lack of services and appropriate referral mechanisms for non-critical COVID-19 cases at the primary level. Tele-medicine thus emerged as an innovative technology-based solution for

delivering services to people in need, especially to families and communities living in remote areas. This technology platform was also beneficial for triaging COVID-19 patients, providing services to non-critical COVID-19 cases, and managing essential healthcare services at the primary level. The approach has also been helpful in providing health services to asymptomatic patients who were quarantined or isolated at home to periodically connect with the service providers, report their health status, and get answers to their queries and guidance on further referral and management.

Model Description

A tele-medicine service platform was set up in the state of Nagaland for providing services at the health and wellness centers to cater to the needs of the catchment population. A technology partner was engaged in connecting the hub and spokes for conducting medical consultations. Mechanisms like e-prescription are being explored through various digital platforms.

The program is involved in building the capacity of the state to establish the necessary infrastructure and deploy service providers at both the hubs and the spokes for the smooth implementation of tele-medicine services targeted to HWCs (Fig. 2.4). Currently, the focus is on preserving the continuity of essential services, providing access to quality health care in remote areas, triaging, and decreasing the pressure on secondary and tertiary care facilities. Once the COVID-19 pandemic is over, tele-medicine will focus on the provision of quality health care. This will reduce out-of-pocket expenditure for specialized services and waiting time, organize referral
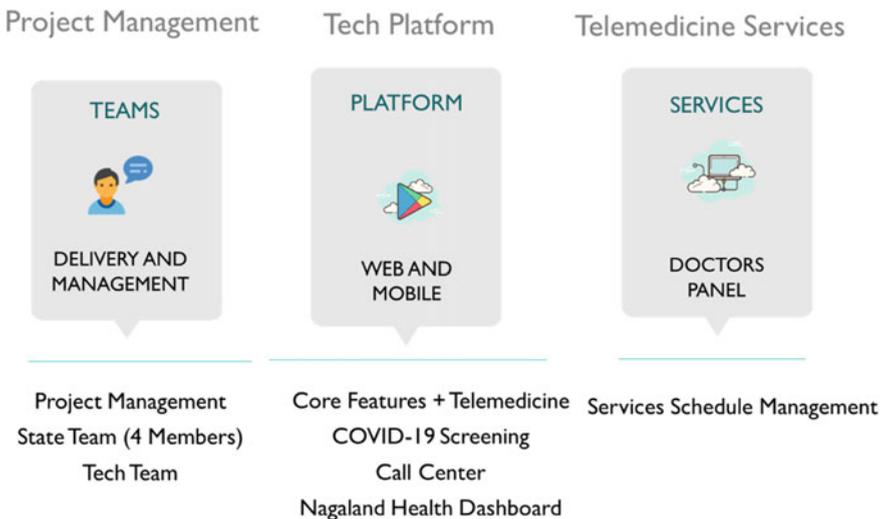

Fig. 2.4 Operational model for tele-medicine

management, and improve health outcomes. It will gradually be transferred to the state government along with making necessary provisions for sustained resources through the National Health Mission's Program Implementation Plan (PIP), thereby maintaining the continuity of tele-medicine services at HWCs.

Outcome Insights

COVID-19 interrupted the delivery of essential healthcare services hugely affecting people's health-seeking behaviors. Tele-medicine has proven to be effective for bridging the gap between patients and health service providers. Patients can now consult doctors at their convenience without having to travel long distances for follow-up. Until October 2020, 19 hubs and 82 spokes had been created. Around 500 consultations have been conducted so far by linking people with general and specialized clinical care.

NISHTHA COVID Sanchar—An Interactive Voice Response System-Based Surveillance and Tracking of COVID-19 Suspects and Patients in Chhattisgarh and Jharkhand

Intervention Rationale

In the absence of a vaccine and an effective treatment for COVID-19, it is critical to contain and control infection transmission through public health measures [8]. Current literature suggests that in contrast to other acute respiratory syndromes, SARS-CoV-2 can be transmitted in the absence of symptoms [9]. Therefore, case isolation at home or in the hospital is an important control measure. Isolation of cases and contact tracing were used effectively for outbreak of SARS in 2003 [10–12]. However, to effectively reduce morbidity and mortality due to COVID-19, it is important to put in place a mechanism for early identification of symptoms to enable immediate contact tracing, isolation, and treatment. Many state governments initially introduced strict surveillance mechanisms to ensure that those quarantined adhered to the norms and stayed at home. Active case finding and management of those placed under home isolation and follow-up of those discharged after successful treatment completion at the hospital are critically important in responding the COVID-19 pandemic.

Owing to the rapid increase in the numbers of cases and limited resources to follow up and monitor patients in the states of Chhattisgarh and Jharkhand, there was an expressed need for establishing a technology-based surveillance system to track and follow up asymptomatic patients under home isolation as well as those discharged

from hospital after completion of treatment. In Jharkhand, only patients under home isolation were monitored. In Chhattisgarh, all categories of patients were followed up.

Model Description

NISHTHA COVID *Sanchar*, an IVR-based active surveillance system, was piloted in four high-priority districts of Chhattisgarh (Durg, Bilaspur, Raipur, and Rajnandgaon) and in the entire state of Jharkhand. In order to accelerate and supplement the state's response to effectively engage with COVID-19 suspects/cases for early identification and treatment, the intervention was designed to track, monitor, and identify symptomatic cases among those under home quarantine and those discharged after treatment completion from hospital. This ensured timely reporting of cases to concerned nodal officers for appropriate referral and management of identified symptomatic individuals. Thus, a model prototype was demonstrated for an integrated public health response for future disease outbreaks.

All the asymptomatic COVID-19 patients who had been quarantined or isolated at home were called on a daily basis using IVR. These individuals were asked a set of questions related to the symptoms of COVID-19 through automated calls. Persons who reported experiencing symptoms on the IVR as well as those who did not were followed up subsequently through manual calls. An inbound helpline number was created for self-reporting of symptoms by the general public. All the symptomatic cases were followed up through manual calls for confirmation and were subsequently linked to the district nodal officer for referral and further management.

Outcome Insights

Using the IVR system to monitor and track COVID-19 suspects/patients is a non-conventional technique. Used in times of need and urgency, it has proven to be strategic in supporting the overwhelmed government's healthcare system and mounting an effective response to the pandemic. In Chhattisgarh, a total of 82,346 cases, under the three categories of home quarantine, home isolation, and post-discharge, were followed up. A total of 3819 symptomatic cases were identified and linked to appropriate care for further management. In Jharkhand, 11,817 cases were followed up of which 941 symptomatic cases were identified and linked to appropriate care for further management. The intervention was successful in demonstrating active surveillance, continuous monitoring, and tracking of COVID-19 suspects and patients. Based on these learnings, the state of Chhattisgarh has improvised a technology-based system and has established home isolation monitoring cells in all its districts.

Jhpiego's Innovative COVID-19 Response Through Reaching Impact Saturation and Epidemic Control (RISE)

Intervention Rationale

The COVID-19 pandemic has stretched hospital resources across India as is also the case globally. Even in high-income countries, emergency medicine and critical care services have been overwhelmed. Low- and middle-income countries like India have, however, been impacted more seriously [13].

The first case was diagnosed in India on January 30, 2020. The coronavirus outbreak hit its first peak in August and September. It became necessary, therefore, to create an affordable and accessible emergency medicine and critical care infrastructure across the nation. Viral respiratory diseases such as COVID-19 can result in critical hypoxic respiratory failure. Consequently, there is a high case fatality rate. Ventilator support is needed for serious cases. Lack of essential supplies and equipment such as oxygen and ventilators and a high burden of cases due to inadequate triaging which can overwhelm the healthcare system and decrease its performance are other possible reasons for high case fatality. Manpower transitioned from other departments was not able to manage complex cases. Health workers for critical care went through extreme physical and mental stress leading to decreased performance. Also, standardized treatment guidelines for the management of COVID-19 were still evolving. Lack of an enabling environment for quality care including streamlined logistics, workflow, and infection control measures, were other deterrents. Inability to use clinical data (due to the lack of systems) to report, analyze, and review data for taking decisions and the absence of a culture for interdisciplinary coordination, continuous review of quality of care, and implementation of practices for service improvement were other causes.

RISE: India's Strategic Response

Jhpiego leads the global project Reaching Impact, Saturation, and Epidemic Control (RISE). Funded by USAID, RISE is implemented in several countries to achieve a shared vision of attaining and maintaining epidemic control with strong local partners.

As a part of the pandemic response, in coordination with the Government of India and the Indian Red Cross Society, USAID donated 200 portable ventilators to assist India in its fight against COVID-19. In addition to ventilators, USAID through RISE supported the provision of technical assistance to the Government of India in capacity building, system strengthening, and ensuring optimum utilization of the ventilators, along with building an enabling environment for critical care of COVID-19 patients. The goal of technical assistance was to improve and standardize intensive care for severely ill COVID-19 patients by identifying potential areas of improvement.

Technical assistance provided to the intervention facilities had a four-pronged strategy. The first strategy was to build the capacity of healthcare providers and develop their competency through asynchronous learning by providing online content that could be accessed when it best suited their schedules. The second strategy was to optimize clinical care by sharing experiences, developing standard operating procedures and management protocols, and enhancing knowledge by developing e-learning modules. The third strategy was to prioritize the use of data for action by identifying e-dashboard indicators for the critical care unit. The fourth strategy was to provide an enabling environment for critical care including efficient ventilators and a strengthened supply chain for commodities.

Jhpiego initiated its activities in August 2020 with an aim to provide technical assistance to 29 recipient facilities in 15 states and three union territories and to create an ecosystem for the efficient utilization of the 200 portable ventilators donated by USAID.

Using a hub-and-spoke model, in collaboration with the National Health Mission, Government of India, state governments, and regional intervention facilities, it was decided to build the capacity of several other facilities in critical care management for COVID-19 (Fig. 2.5).

Engagement with Critical Care Working Groups

In order to build a system for interdisciplinary coordination, there was a continuous review of quality of care and implementation of practices for service improvement, and Jhpiego established facility-based Critical Care Working Groups (CCWGs) to provide oversight and standardize care for critically ill COVID-19 patients in the facilities. CCWGs were able to provide interdisciplinary inputs. They were effective in ensuring safe adoption of new management protocols for COVID-19 and facilitating the upscaling of this approach. The CCWGs met twice a month to discuss opportunities and challenges and with the experts from other institutions to promote cross-learning, exchange ideas, and share knowledge. By October 30, RISE had facilitated the formation of CCWGs in 9 facilities including the All India Institute of Medical Sciences (AIIMS) Jodhpur, AIIMS Patna, AIIMS Rishikesh, AIIMS Nagpur, AIIMS Bhopal, AIIMS Gorakhpur, Institute of Medical Sciences (IMS), Banaras Hindu University (BHU) Varanasi, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences, Shillong, and the Railway Hospital Chakradharpur. CCWGs already existed in AIIMS Bhubaneswar and AIIMS Bhopal.

Situational Assessments Using Specific Tools

Situational assessment was undertaken to identify specific needs and to contextualize intervention strategies prior to initiating implementation. Situational assessments
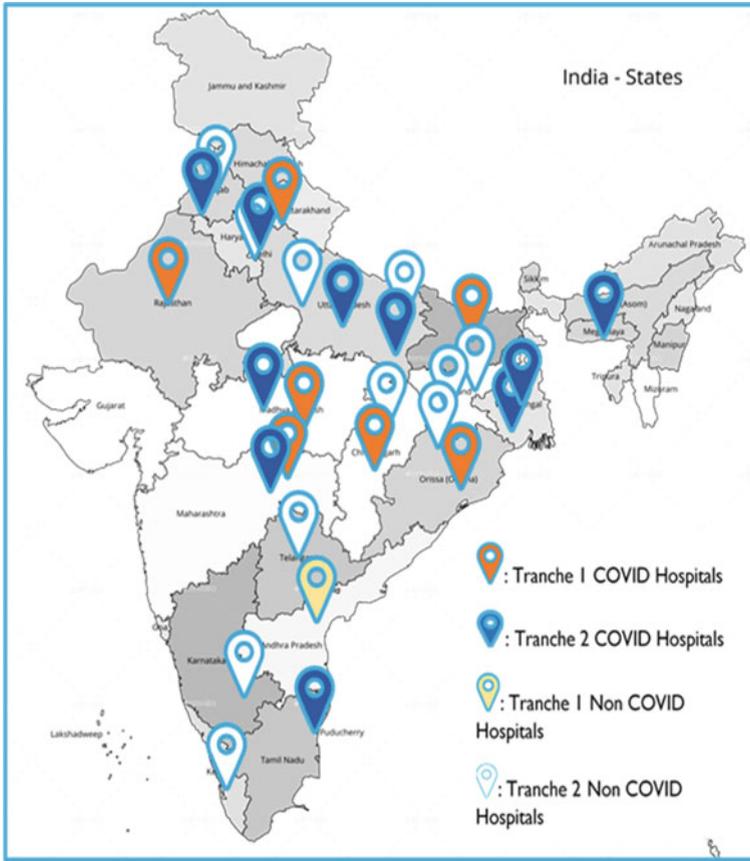
Fig. 2.5 Recipient facilities across India

were conducted jointly by members of CCWG and the RISE India team in the months of September and October 2020. By the end of September 2020, situational assessments had been completed in six Tranche-1 facilities and twelve Tranche-2 facilities. RISE India developed two tools for use in these assessments: (1) a facility situational assessment tool to understand the existing needs of the facility in critical care and to assess the existing critical infrastructure, trained human resources, logistics, and availability of policies and protocols and (2) a knowledge assessment tool which was a self-assessment tool for providers involved in critical care. It was developed to identify self-perceived needs of the providers in capacity building.

Strategic Interventions Under RISE

The formation of the CCWGs remained the crux of all the strategic interventions planned under RISE, and through these facilities-based groups, program strategies and interventions were planned and contextualized to address specific bottlenecks and gaps identified during the situational assessment. RISE is an ongoing program. As the pandemic evolves, the strategies will also evolve based on need. The following are some of the strategies that were implemented to address the current needs.

Capacity Building

Jhpiego initiated building of the clinical capacity of facility-based, multi-disciplinary teams for COVID-19 case management by following different contextualized approaches to enable the facilities to manage a surge in the case load.

Capacity Building Network

Healthcare facilities were classified into three levels based on their training capacities and their status as COVID facilities in order to develop an interconnected network of these facilities with a focused approach for capacity building for each level in a phased manner. The facilities were divided into three programmatic levels based on their status as COVID facilities and their ability to train human resources. Eleven tertiary COVID facilities with existing training capacity were considered as Level 3 facilities that could mentor lower-level facilities on focused training capsules for COVID care. Eleven tertiary and secondary COVID facilities requiring capacity building were considered as Level 2 facilities which could be trained on critical care management by Level 3 facilities and could support Level 1 facilities. The remaining seven secondary non-COVID facilities requiring capacity building were considered as Level 1 facilities that would require preparatory capacity building support through Levels 2 and 3 facilities.

Hub-and-Spoke Model for Training and Mentorship

The hub-and-spoke model is a unique model for capacity building, wherein some of the Level 3 facilities disseminate knowledge, practice, and experiences in managing COVID-19 patients to facilities including non-RISE intervention facilities such as
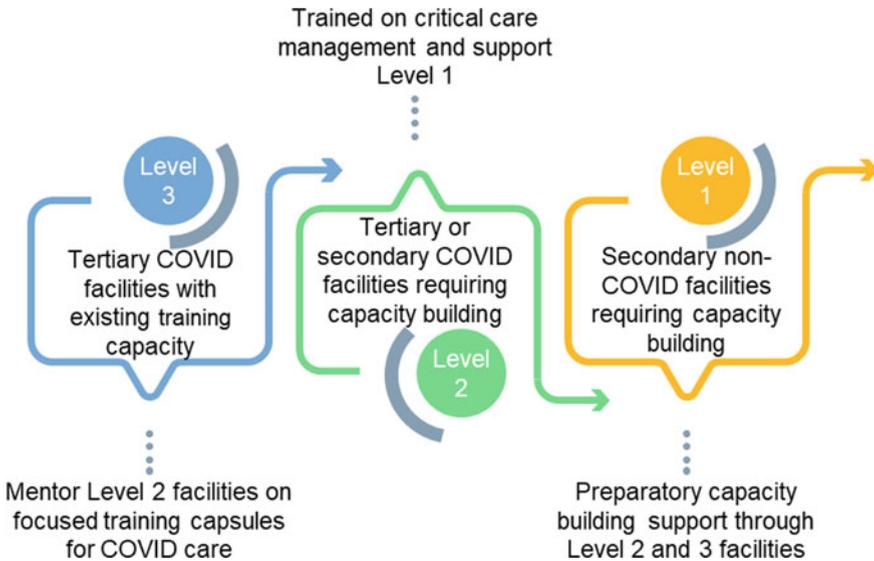
Fig. 2.6 Three levels of COVID facilities

the dedicated COVID health centers (DCHCs)[1] and the dedicated COVID hospitals (DCHs) in the state. The four identified hubs under RISE were AIIMS Bhopal, AIIMS Raipur, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS), Shillong, and AIIMS Bhubaneshwar. The spokes for each hub were defined by the respective state governments and the hub facilities. The hubs helped the states in formulating standard operating procedures and guidelines for intensive care units (ICUs). The hubs actively helped the states in forming working groups and define the scope of work for these groups. These mentorships used contextualized methodologies for training webinars, hands-on orientations at skill stations, and classroom-based didactic sessions (Fig. 2.6).

By October 30, 2020, eight batches of hands-on workshops on 'Critical Care Management of COVID-19 Patients' were organized at AIIMS Bhopal, Center of Excellence for Clinical Management of COVID-19, to train 83 doctors and 82 nurses. This initiative was jointly supported by the National Health Mission, Directorate of Health Services, Directorate of Medical Education, Madhya Pradesh, and RISE India.

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[1] The dedicated COVID health centers (DCHCs) are hospitals that offer care for all cases that have been clinically assigned as moderate. These hospitals have beds with assured oxygen support. Every DCHC must necessarily be mapped to one or more dedicated COVID hospital (DCH). Every DCHC must also have a dedicated basic life support ambulance equipped with sufficient oxygen support for ensuring safe transport of a case to a DCH.

e-Grand Rounds

Using a virtual platform, the e-Grand rounds provided a unique opportunity to doctors to improve their care giving skills through clinical case discussion with peers. The e-Grand rounds were used to present and discuss specific COVID-19 cases, share experiences, and seek expert opinion from a panel of experts. The e-Grand rounds also served as platforms to share updates on treatment and management protocols, promote knowledge sharing, and as the pandemic evolved, review new evidence and changing epidemiology.

The first e-Grand round on 'Clinical Challenges in COVID-19 Management,' organized by the Jhpiego team and conducted by AIIMS Patna on September 21, 2020, was attended by 103 critical care providers from 20 medical institutions, including the 10 regional AIIMS. Two clinical cases were reviewed and discussed in this workshop.

e-Learning

Healthcare providers, like doctors and nurses involved in active COVID-19 duty, often found it challenging to attend physical in-person training sessions due to their work schedules. To counter this challenge, it was decided to use asynchronous e-learning or a hybrid training package which was formulated after identifying program needs of specialists, medical officers, nurses, and paramedics by the CCWG at the supported facilities. The virtual training package allowed healthcare providers to take the training as per their convenience. Training covered topics related to infection prevention and control, general triage, and clinical management of hospitalized COVID-19 patients. Trainings were supported by electronic simulation of critical care and e-mentoring.

> On 4th September, I was on night duty in the ICU and the Zoll Ventilator suddenly showed a low battery charge of 25 percent. We feared that we may have to shift the patient but the training which was conducted by the RISE team on the operations of the ventilator was very helpful in providing the requisite guidance to troubleshoot and recalibrate the ventilator machine thus saving the patient's life. I thank Dr Ashwini Kumar (from RISE India) for insisting that I attend the training program. Otherwise, I may not have been able to save a life. Thank you RISE team!
>
> Ajay Pal Singh, Nurse In-charge COVID ICU, AIIMS Jodhpur

Data for Action e-Dashboards

Jhpiego provided support in developing a process for data collection, data management, and data analysis which could be used across facilities and the healthcare system for improved decision-making. The e-dashboards utilized data from existing

care processes for decision-making and helped in monitoring pandemic responses across facilities. These dashboards were developed in consultation with the CCWG and were customized for each facility, contextualizing the requisite quality indicators and available data sources from care processes. This allowed regular monitoring and tracking of varoius indicators.

Building an Enabling Environment

Logistics

The Jhpiego team provided support to facilities for the procurement process for COVID-19-related commodities and also ensured the availability of consumables required for the ventilators donated by USAID. Jhpiego worked with some states like Madhya Pradesh for allocation of additional budgets to ensure the provision of PPEs and to further strengthen the ICUs.

Troubleshooting

RISE India provided troubleshooting support to facilities by coordinating with them and the manufacturers and installers of the USAID-donated ventilators, as and when the need arose.

Outcome Insights

Within a period of 75 days, the RISE program was able to conduct capacity building interventions for 343 healthcare providers who worked at the critical care unit or were planned to be posted at the critical care unit for COVID-19. These included 125 nurses and 218 doctors working in the facilities to improve the ICU environment. Emergencies such as COVID-19 require a rapid response to address existing systemic gaps. RISE was able to achieve this by using a multipronged approach through partnership with various stakeholders supporting critical care. It was thus able to save lives. While infrastructure gaps like the lack of ventilators could be addressed through immediate financial allocations, filling the requirement for trained and skilled human resources requires long-term commitment. With an ensuing second wave of the disease, there was a strong need to ramp up all preparatory activities including those for capacity building and ensure the availability of trained and skilled human resources to support critical care needs.

Jhpiego's Efforts in Safeguarding Quality Maternal Care in India's Private Healthcare Facilities During COVID-19 Pandemic

At the time when healthcare systems were overstretched in dealing with the COVID-19 pandemic, the skills, competence, and confidence of frontline healthcare workers, and hospital preparedness to ensure that women and newborns continue to get quality care, is important.

In India, one out of every three facility births occurs in private institutions. With support from Merck Sharp and Dohme (MSD) for mothers and in partnership with the Federation of Obstetrics and Gynecological Societies of India (FOGSI), Jhpiego worked with private facilities in the states of Uttar Pradesh, Jharkhand, and Maharashtra to build skills, confidence, and resilience and to prepare private facilities for providing quality intrapartum and immediate postpartum care to mothers and newborns through a quality certification program called *Manyata*. Launched in 2013, the *Manyata* program responded to a glaring need to address quality of care in private maternity facilities. No national system existed for ensuring the quality of private health services. *Manyata* bridged this gap by ensuring that well-trained healthcare providers ensured respectful and safe experiences for mothers during childbirth, while upholding the best clinical practices. As of July 2020, there were about 700 *Manyata*-certified facilities, of which 390 had received quality improvement (QI) support from Jhpiego and additional 600 were enrolled to work toward the goal that no woman should die during childbirth. With the COVID-19 crisis putting an unprecedented stress on healthcare providers in public health facilities, the private sector was primed to support and complement the government's commitment to ensure the continuation of high-quality essential services.

In the early days of COVID-19, despite numerous global and national guidelines for pregnant, laboring, and breastfeeding women, many healthcare providers were unsure how to provide care to mothers and their newborns safely. By the first week of March 2020, Jhpiego had orientated the staff of *Manyata*-registered and certified facilities to prepare them for COVID-19. A comprehensive orientation, conducted virtually, focused on infection prevention and control measures while upholding the principles of respectful maternity care. This was followed by skills updates and discussion forums.

Jhpiego began with conducting online sessions on ensuring preparedness of facilities during the COVID-19 pandemic for the members/non-members of the *Manyata* family. From March to May 2020, about 650 doctors and staff from 290 facilities benefited from the orientations.

The COVID-19 pandemic has accelerated the use of digital and tele-health platforms and has digitized the delivery of QI to address the pandemic which holds great promise. Realizing the need of the hour, as physical visits for handholding of the facilities for QI under *Manyata* were not possible, Jhpiego utilized the initial period of the lockdown to adapt the mentoring and support visits (MSVs) for the virtual medium and ensured that all the facilities which had initiated MSVs could complete

their QI package. Prior to the pandemic, few providers engaged in virtual trainings. However, there was a large increase in digital engagement as local providers and facilities adapted to the pandemic working environment to maintain high-quality care and keep the patients and themselves safe. In collaboration with Extension for Community Healthcare Outcomes (ECHO) plateform-India, Jhpiego converted the entire QI package into a structured IT-friendly learning and mentoring package for the 12-week modules. About 1000 doctors and nurses participated in these COVID-19 briefings across 248 *Manyata* facilities in the three states that are currently being supported by Jhpiego.

Even under normal circumstances, a mother and her baby are most vulnerable during childbirth. But the COVID-19 pandemic significantly increased the risk for pregnant and breastfeeding mothers and their infants, possibly undoing the progress India had made in reducing maternal mortality [14, 15]. Investment in continuous quality improvement and support from the *Manyata* team in establishing its COVID-19 preparedness protocols kept the *Manyata* facilities ahead of the curve in their response to the pandemic.

'We learned to recognize the symptoms of COVID-19. We didn't know about them that well [prior to the *Manyata* COVID-19 session],' said nurse Promila. 'Through *Manyata*, we have received full support and information… My staffs' fear were removed because of this. They knew how to look for signs of COVID and prevent infection from spreading,' said Dr. Priya.

In Maharashtra, the Indian state most impacted by the pandemic, Dr. Karthikeya Bhagat of the *Manyata*-certified Grace Maternity and Nursing Home in Kandivali (West), Mumbai, said, 'I am amazed at the way they [nurses] are managing the hospital in this time of COVID-19. They are asking the right questions to patients on the phone and in person. They are conversing confidently and reporting sensibly. They are sure about what they are doing and understand the actions to be taken to conduct safe deliveries at this time [16].'

Leaders of facilities who had gone through the *Manyata* journey championed the program, especially when they saw the benefits of its focus on quality. 'Because *Manyata* deals with clinical standards and because it specifically deals with staff nurses, it has a great advantage in a situation of a pandemic like COVID-19 where you need to put in many more measures. But if you are unsure of your routine work, then those measures will not work too well or you will find it more difficult to implement additional precautions. Every facility should get *Manyata*-certified,' said Dr. Bhagat.

This quarter, due to the COVID-19 pandemic, business was not as usual. Jhpiego was quick in ensuring that the QI process changed from an on-site mentoring approach to a total e-mentoring approach. Once the COVID-19 situation eases, an efficient QI journey through a hybrid model of virtual learning interspersed with occasional physical mentoring visits to reduce time during the period of engagement to 3–4 months is envisaged.

Key Learnings from the Interventions

The COVID-19 pandemic posed a crisis to the health system which was intensified with the increasing number of cases. Jhpiego quickly mounted a multi-sectoral and multipronged approach to address the challenge by providing technical support to enhance preparedness capacities and resilience of the healthcare systems nationally and across 15 states of India. Several cross-learning opportunities were created during the rollout of interventions. Of all the conventional and technology-based approaches, technology emerged as a clear winner. Jhpiego's experience of training various categories of healthcare workers and managers showed that using virtual platforms for training and mentoring was effective for transmitting knowledge as well as for developing skills. The need to invest more in health workforce protection and capacity enhancement was clearly highlighted. Co-designing local solutions for local problems by following a decentralization approach were very effective. Risk communications, with a focus on basics, had a multiplier effect. Community-centered, community-owned, and community-driven solutions are needed to achieve self-reliance. These are summarized below:

- **Digital technology**—Digital solutions play a pivotal role and can be used for innovative service delivery, mentoring, and counseling through tele-medicine.
- **Health workforce protection**—Enhanced health protection and building competencies to cater to public health emergencies.
- **Innovations**—Deployment of innovative solutions to accelerate access, amplify impact, make health systems resilient, and increase equity in coverage.
- **Risk communication**—Strong efforts for health promotion and preventive measures, focused on basics, are simple things that can have a multiplier effect.
- **Decentralization**—There is a need to focus on decentralization of services, drugs, and diagnostics to enhance access to health care and equity in coverage.
- **Communities**—There is a need for community-centered, community-owned, and community-driven solutions to achieve self-reliance.
- **Resilient primary health care**—Public health facilities and healthcare providers are the fulcrum of India's COVID response. There is a need to invest more in primary health care.

Way Forward: Toward Resilient Healthcare Systems

Healthcare system resilience is defined as the capacity of the health system to prepare for and effectively respond to crises; maintain essential functions when a crisis hits; be informed by lessons learned during the crisis; and reorganize if conditions require it [17]. Health systems are resilient if they protect human lives and achieve good health outcomes for all during a crisis and in its aftermath. Response to a crisis, be it a disease outbreak or any other disruption resulting in a surge of demand for health

care (e.g., a natural disaster or a mass casualty event), needs both a vigorous public health response and a highly proactive and functioning healthcare delivery system.

Beyond the acute phase of COVID-19, where the focus has largely been on mitigation and preparedness for the pandemic, Jhpiego's comprehensive healthcare program aims to ensure mitigation of the disruption of essential primary healthcare services, including RMNCH+A and TB services, and continuity of essential health services. The program envisages providing technical assistance for building resilient primary healthcare systems through better coordination and strengthening of governance mechanisms, facility-level preparedness, piloting integrated disease surveillance mechanisms, enhancing the use of data to guide evidence-based decision-making, re-engineering and redesigning public health facilities, and setting up functional rapid response teams that can be quickly mobilized to address public health emergencies.

COVID-19 and other similar pandemics have clearly shown the need for developing the capacities of national and state governments to respond to infectious diseases in line with global guidance and international health regulations. Jhpiego worked closely with the national and state governments to plan for minimal disruption of essential services by defining service packages at the facility, community, and home-based levels of care and developing continuity of care pathways. The roles and responsibilities of the primary healthcare teams were redefined by task-sharing and task-shifting. Alternate service delivery and supply chain mechanisms to minimize the disruption of essential services in primary healthcare settings were explored.

Jhpiego plans to provide technical assistance for health workforce protection by enhancing technical knowledge and skills of the healthcare teams, supporting competency development, advocating for task-shifting/task-sharing, developing an enabling policy environment, facilitating the provisions of adequate personal protective equipment, and ensuring the mental well-being of healthcare providers.

Jhpiego's goal is to save lives, improve health, and transform the future of women, children, families, and communities. It partners with governments, health experts, and local communities to build systems that guarantee a healthier future for women and families. Through these partnerships, it builds more resilient healthcare systems that are better prepared to deal with health emergencies and can protect all, especially the most disadvantaged and vulnerable communities.

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Chapter 3
Using Technology to Harness Existing Resources for an Emergency: COVID-19 Response

Gopi Gopalakrishnan

Abstract The use of technology to respond to the COVID-19 emergency is described. The sudden lockdown imposed by the government with just a four hours' notice resulted in a paralysis of the healthcare system. World Health Partners (WHP) responded immediately to this crisis. WHP worked in partnership with the state governments of Bihar and Andhra Pradesh. The plan was that the state governments would provide the personnel and WHP would set-up a digitized system for providing health services to the people by using tele-medicine.

A quick-to-access dashboard was created to give details in real-time of the number of doctors and assistants who were logged-in, the number of calls received and were attended to, prescriptions issued, and COVID-19 suspects identified. Doctors' absenteeism proved to be a challenge in Bihar. Consequently, the full potential of the project could not be realized in Bihar. In Andhra Pradesh, however, the project was very successful. Despite receiving less number of calls, more consultations were provided through the tele-medicine project in Andhra Pradesh. The major reason for this success was the high level of political commitment by the state government which led to the availability of trained medical personnel for the project. The entire process of the project was successfully transitioned by WHP to the state government of Andhra Pradesh.

Waking Up to a Crisis

By early March 2020, it was evident that a major health crisis was at India's doorsteps. The only administrative perspective available for combating the rapid spread of the virus—a complete lockdown—was what the Chinese government had done in Wuhan. It was clear the Indian government would also move in that direction since it was the intervention most countries affected by the virus were implementing. While people were just digesting the idea of a life with restrictions, the total surprise in

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India was the four-hour deadline with which the government imposed the lockdown on March 24. Everyone was caught completely unprepared.

Professionals instinctively knew that this drastic step would hurt the migrants the most, especially those working in the informal sector. Bihar was one of the largest contributors to this sector, and our organization World Health Partners (WHP) has a deep knowledge of the constituents' psychographics since it has been working in the state for long. A significant proportion of WHP's senior management comes from a large Bihar-based organization called *Janani* that has been running extensive programs in the state since the mid-1990s.

The bureaucracy showed itself at its dysfunctional worst—the short deadline combined with poor assessment of its implications on the population was at the core of what followed. The political leadership should have known the administrative deficiencies of the bureaucracy since two bold and major decisions in the recent past—demonetization and Good and Service Tax (GST) reform—were handled without a factor of anticipation so essential for decisions that impact at scale and beyond the line of sight. Even some union ministers expressed deep concerns about how such momentous decisions suffered from a lack of implementation skills of the executive. The bureaucracy committed a fundamental miscalculation here too in believing that a 'command and control' way of issuing official edicts would lead people to automatically fall in line and stay indoors. It was instinctively known, however, that it would not be the case. The administration also did not have a Plan B. A predominant proportion of migrants from Bihar support their families with daily wages, and once the revenue flow was disrupted, desperation set in quickly as they really did not have the option to stay indoors. Their natural reaction was to head back to their villages where there would be a modicum of social and economic security.

With no support system in place, each migrant family was left to its own devices with the clamor to reach their villages through whatever means or modes of transport that they could get—trucks, tractors and, most often, by foot. It was distressing to see women carrying small children walking miles each day with no assurance about where their food, water, shelter, and emergency care would come from. There was also no reliable arrangement to handle medical emergencies which are inevitable in such situations.

World Health Partners' (WHP's) team wanted to respond to this crisis immediately. The focus was on figuring out how medical support could be provided by using some applications already available in its arsenal. The main problem was that the tele-medicine platforms were designed with a mediator in mind—a village-level entrepreneur or an auxiliary nurse midwife (ANM) in a government facility—who would facilitate consultations with a remotely located doctor after registering patients and generating vital parameters such as temperature, blood pressure, and pulse.

The migrant population needed to have a modified system which would enable it to bypass intermediation and establish contact directly with doctors. Market research firm techARC in December 2019 estimated that over 23% of subscribers in India still used 'feature' or dumb phones so there was a need to tailor the platform in suitable ways so migrant communities, who are likely to fall into the non-smart phone category, can also access the consultations with whatever phone they possessed.

Finally, the system should also offer as many services as possible free of charge given the disrupted economic conditions of the migrants. This meant that the calls and consultations could be free but there was no way of delivering medicines and undertaking laboratory investigations.

Resource Crunch

Many actions were set in motion within WHP as soon as the gravity of the situation became evident. The tele-consultation application was reconfigured in a record time of two days for a direct interface between the doctor and the patient without the need for real-time intermediation. A system also needed to be developed by which the call charges would not be passed on to the patient. WHP fortunately had an easy-to-remember number (80 10 11 12 13) already available which was quickly reactivated for receiving calls. The employees of WHP, stranded at home in various parts of the country, were brought in as assistants. Most of them had a company-issued laptop with access to the Internet so setting up the assistants' network could be done easily. But they needed to be trained remotely. However, the problem was that WHP did not have enough doctors who could be deployed for this large-scale program nor did it have the resources to hire them. In a tele-medicine program, doctors account for almost two-thirds of the cost. The only option was to ask for volunteers.

Using various channels, WHP issued a call for volunteer doctors who could speak Hindi to offer their services from their homes. While WHP would not be able to pay for their services, its system would enable them to connect with the patients without incurring call charges. Reaching out to a number of NGO networks was relatively easy. All social media channels were used to announce the plan to reach out to migrants. Concurrently, WHP started fine-tuning an education software. This software was developed by Beaconpath Foundation, a non-profit sister organization that had been set up to deliver quality education to rural children through tele-education for remotely training participants in large batches.

WHP started providing consultations on April 4, 2020, with three doctors who had worked for the organization in the past and whose training needs were limited. But the general appeal for a larger number of volunteer doctors barely produced any results. In the meantime, the initial estimate that the virus would be brought under control within days or weeks was slowly being replaced with concerns of a long haul. The major question was how to sustain a program in the long term as getting volunteer doctors even for short-term work was so difficult. WHP needed to go back to the drawing board and rework the approach.

This is where WHP's operational strategies guided the program. For sustaining programs at scale, WHP believes that there are only two options: (1) make services economically viable so the client can absorb the costs and the organisation does not require donor funds or (2) get support from the state's health budget. External donors will at best be able to kick start projects in the early stages by providing support for capital costs but will not be interested in absorbing recurring costs. This is true even

in normal times, and in an uncertain period, such as a pandemic, the hesitation is more pronounced. If the organization is not able to offset costs through contribution from patients, as was the case with the migrant populations uprooted from homes and short of resources, the only other option is to partner with governments that have the ability and inclination to find a quick solution through emergency funding. The capital costs for the tele-medicine solution were minimal since most of the solution was ready and WHP's own technical team was contributing its time voluntarily to reconfigure the solution. However, the government's help was needed to sustain the project. Partnerships with governments are not easy. In the case of migrants, there would also be jurisdictional problems as Bihari migrants, for instance, would be transiting through other states and so many support services cannot be organized in a coordinated way.

WHP Makes the First Move

WHP's first step was to refocus the target segment. Instead of paying attention to migrant populations moving across the whole swath of north India, in each state the focus would be on populations stranded at home within which a special window would be created to engage with migrants entering the state. This meant, for instance, that the focus in Bihar would be to provide ambulatory or outpatient (OPD) care to the general population including migrants moving in from other parts of the country.

Adopting this line, mails were sent to various states including to the Health Ministries of Bihar, Andhra Pradesh, Tamil Nadu, Gujarat, and West Bengal. In Bihar, where WHP has had a long presence and had been dealing with many senior officials who knew WHP's work closely, a dynamic Principal Secretary responded immediately and asked for a presentation to be made to him and to the minister to explain the plan. Andhra Pradesh was approached through a retired Health Secretary of the Government of India who currently lives in Hyderabad and has close links with the state ministry. In Tamil Nadu, the contact was a former Chief Secretary— the highest position for a bureaucrat in a state—who had worked with WHP on a *kala azar* (visceral leishmaniosis) project under a leave of absence some years ago. The senior-most officials in the Health Ministries of Gujarat and West Bengal were sent mails with copies marked to some influential persons working closely with the ministries.

The plan outlined was simple: The state governments should provide all the personnel from their pool of employees stranded at home, and WHP would set up a system by which it would provide consultations from its own locations. WHP would use its current set of hardware including servers, trunk lines, and mobile telephony to link up all those involved and would also modify the application to suit the COVID-19 situation.

WHP is an NGO that has extensive experience in handling infectious diseases at scale through its program focused on early detection and treatment of tuberculosis cases among the poor. WHP has found that stigma plays a critical role in dampening

the response of the community to seek care for infectious diseases. Privacy for the individual and his/her family becomes crucial, and all care must be taken to ensure that the client feels reassured that the services provided are confidential. Following this norm was the main reason why WHP's program raised the number of annual tuberculosis (TB) patients' notifications from 4000 to 83,000 within four years in Bihar.

Right from the beginning, therefore, the approach was to offer ambulatory or outpatient care for common morbidities and use it as an opportunity to identify COVID-19 cases. Inviting persons to call up just for COVID-19 would not be appropriate because of people's fears of being marked. Since both the migrants and the people locked down at home in any case needed access to medical help for common morbidities, it became the right platform for isolating cases as per the Indian Council of Medical Research (ICMR) guidelines.

The problem with the guidelines, however, was they went far beyond medical aspects to include factors related to behavioral elements such as international travel, contact with an infected person, working as a healthcare professional, and contact with hot spots. It was also clear that overloading the doctors with non-medical responsibilities during the consultation process would impose a huge burden and translate into a significantly higher cost. So, the application needed to be further repurposed to handle the consultations in two parts: divert callers to non-medical assistants first, and, on fulfilment of initial formalities and the capture of relevant data for registration, re-route the calls to the doctors. The assistants would take symptoms as well as behavioral details and feed them into the system which, using powerful algorithms, would generate differential diagnoses for the doctors by the time the calls moved to them. This arrangement would minimize the doctor's time for each consultation which was necessary to bring a higher degree of efficiency. Another critical feature was a flashing alert the consulting doctor would receive on the screen to indicate, on the basis of what the non-medical assistants had gathered, whether the caller had shown some symptoms or risky behavior related to COVID-19. Depending on the severity, it would be either an orange or red alert. The solution was programmed to give an orange alert for meeting one criterion and a red alert for meeting two or more criteria.

It was also important for the assistants to obtain the precise location of the caller because any suspected COVID-19 case would be referred to the nearest government facility for follow-up action such as confirmatory testing, contact tracing, quarantine, and hospitalization. In consultation with the ministry, it was decided to instruct the doctors not to inform the patient if COVID infection was suspected to avoid unnecessary panic. The doctors would probe for possible COVID-19 and check a box in case infection was suspected. This information was incorporated into a master list and broken-down location-wise. And, the patient was sent to the nearest primary health center for follow-up care. In order to locate the patient precisely, the system needed to be loaded with geographical data in a drop-down form that showed villages, hamlets, and urban wards for retrieval in real time when a caller was being registered. It is a miracle that within one day, the team building technology-related

solution within WHP was set up by which all such information could be uploaded into the system.

Bihar Responds First

WHP never received a response from the administrations in Tamil Nadu, Gujarat, and West Bengal but Bihar proved to be different. The lockdown in Bihar had led to a complete shutdown of OPD services in all government facilities. Fortunately, almost all the doctors and non-medical employees had access to computers and to the Internet which provided a wonderful platform to address the need. The Principal Secretary in Bihar moved very quickly and gave the requisite go-ahead starting with a comprehensive presentation to his whole team that would work with WHP in mounting the operation. Since WHP already had its own team in place in the state capital Patna, where it was implementing a major tuberculosis project, coordination was easy. Using the application developed for remote classrooms by the Beaconpath Foundation, its sister organization that worked on rural education, WHP, explained in detail the application to all in the ministry ranging from the minister to the officials who would take day-to-day decisions. Later, WHP's team used a sophisticated briefing arrangement that the State Health Society had created for remote engagement with its officials to impart training.

Despite the urgency, however, the ministry was firm on formalizing the relationship to safeguard against any possible mishap. Work could not begin until this formal paperwork was completed. WHP was asked to produce the draft of an agreement which was circulated among various departments of the government for approval. Finally, a Memorandum of Understanding titled 'Providing e-Teleconsultancy Services for Medical Advice' was signed between WHP and the Government of Bihar on April 11, 2020. And, training sessions began immediately.

The government decided to deploy doctors and assistants from the district hospitals in two shifts since they were already on emergency duty but were not providing OPD services due to the lockdown. On the request of WHP to provide the personnel who would work on a fixed schedule, the ministry fixed the consultation hours from 8.00 am to 8.00 pm every day, Sunday included.

WHP created a special Web site whose details were sent to the doctors and assistants through the channels already available with the government. Training modules were prepared overnight, and the doctors and assistants were batched in groups of 50 for the training. Training was first given to the civil surgeons of all districts explaining the tele-consultation module and the role of each constituent. This became critical since the civil surgeons were tasked with follow-up services to COVID-19 suspects.

In its earlier attempts to integrate tele-medicine in government programs, WHP had faced the greatest resistance from doctors. In Bihar, doctors always showed a tendency for a high degree of absenteeism ostensibly because of their involvement in their own private practice. But COVID-19 had placed them in harm's way since healthcare providers are among the most vulnerable to the virus. WHP felt this was a

huge opportunity to digitize service delivery which in the post-COVID period would address a number of management problems that had been found to be intractable in the analogue world.

Training of the doctors and assistants went off smoothly. Since many parts of the solution were taken from the tried-and-tested application already in use for rural healthcare delivery, the interactions helped to lay down the foundation for intuitive solutions for the doctors and other personnel. The interest that the Health Minister showed provided the impetus for the team of officials to move forward rapidly and the project was formally launched on April 17, 2020.

WHP offered its own easy-to-remember number to the project (80 10 11 12 13), and the government released prominent advertisements in the largest circulating newspapers promoting the service. The response was instantaneous. Within the first week, this number received 11,830 calls. The system also needed to accommodate a number of features to ensure that the callers and providers did not incur any expenses for calls. Equally important was the need to manage the medical and support resources in a way that minimized waiting time for callers. WHP realized that while digital connectivity had many advantages, it also posed a major disadvantage for callers. Unlike patients waiting at the reception of a physical facility, the waiting time in a tele-medicine context was always magnified in the caller's mind. It felt longer than what it really was since the caller had no other element distracting his or her attention.

While the project got off to a good start by eliciting a sizable response from the community, the old bugbear of the public sector—absenteeism—became a major hurdle. Even though 248 doctors and 260 assistants were enrolled through the website, very few would report for duty by logging in at the appointed time. Even worse, a number of them would log out within a few minutes without realizing that in a digital system every step was remotely trackable. While the assistants too showed indiscipline in this regard, it was the most pronounced among the doctors.

The call flow started in right earnest within a week when news about the service spread through word of mouth. While the attendants handled 99% of the calls, the doctors completed only 15% of the consultations. By five months, the project had received over 126,000 calls of which over 17,400 consultations were done and 272 suspects identified. There were two reasons for this dichotomy. A significant number of calls were just inquiring about symptoms, and only a few doctors logged in regularly during their scheduled hours to provide consultation. Both the senior administrators and WHP were concerned that the doctors' unresponsiveness would automatically undermine the reputation of the project and result in tapering-off of calls in due course. The administration issued stern verbal warnings through the civil surgeons' office to the doctors, and a formal notice was sent later that action would be taken for dereliction (Fig. 3.1).

Bihar had indicated right from the beginning that the state would not be able to bear the costs of servers and other hardware and expected WHP to absorb this cost. For WHP, this was an inopportune time since most of its projects had ended or were on the verge of ending and so it had limited resources. WHP made an urgent request to many donors and also requested the Bihar government to recommend its case to donors. Since the Gates Foundation had a large presence in Bihar and WHP had a
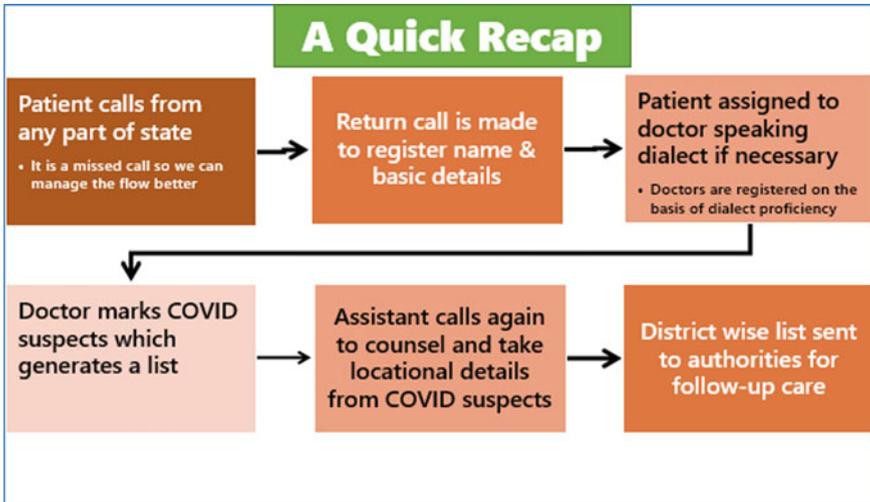
Fig. 3.1 Consultation process flow

strong relationship with the organization, there was a response by which a grantee, that had unspent money, was instructed to pay it to WHP to offset the costs.

Every consultation ended with a prescription being issued to the caller, and a medical record was created under a unique ID, in most cases the same as the mobile phone number. While persons using smartphones would get a regular prescription with doctor's registration and qualification details as prescribed by law, the ones with non-smart feature phones would only get the highlights of the prescription consisting of name, diagnosis, and medicine details. A URL which was part of the message could be used by the caller to access the full prescription from the website. This information was needed because the callers had to buy the medicines from private pharmacies which fortunately were allowed to stay open during the lockdown.

A quick-to-access dashboard was created to give details in real time of the number of doctors and assistants who were logged in, the number of calls received and attended to, prescriptions issued, and COVID-19 suspects identified. Details of suspects with demographic and locational data were forwarded to the government for follow-up steps including confirmatory tests and contact tracing.

WHP implemented the project in earnest, and there was perceptible improvement of doctors' and assistants' participation as the project progressed but WHP staff were not sure whether the full potential was realized, especially in comparison with the Andhra Pradesh project where the same solution was used.

Chief Minister Gives the Push in Andhra Pradesh

The mail sent to a former Health Secretary to the Government of India, now retired and settled in Hyderabad, was the trigger that started the program in Andhra Pradesh. Within a day of sending the mail, WHP received a call from the Special Chief Secretary, Health, Medical and Family Welfare, who is the administrative head of the Ministry, asking about details of the WHP solution. Since Bihar had already started the program and WHP had a sense of what modifications were needed to make its application relevant in a public sector context, the presentation to the Andhra Pradesh ministry was highly focused on the problem and an effective solution.

Andhra Pradesh moved very fast because the Chief Minister took a keen interest in the Ministry's planned response. WHP received the support of the Chief Minister who understood the need for providing comprehensive primary health care through a tele-medicine system and using the interface as an opportunity to isolate COVID suspects. The Chief Minister also authorized the release of medicines to the patients from the nearest primary health center of the government each of which, fortunately, already had access to the Internet so the prescriptions could be downloaded to cross verify the details when the patients presented their prescriptions. Initially, the medicine delivery success rate was around 63% because people needed to come to the PHC which could often be quite a distance away, making it difficult for a locked down population to negotiate. The Chief Minister, during his regular review, wanted to increase the delivery rate and ordered the involvement of the auxiliary nurse midwife (ANM) posted at the sub-center to enable doorstep delivery. The sub-centers are the last mile service delivery government resource and using them meant reconfiguring the solution accordingly.

Andhra Pradesh created a team of 435 doctors and 357 assistants who were largely drawn from a government-supported private network. This ensured a higher degree of efficiency since these personnel adhered to the schedule and also provided good quality services. WHP decided that the best way to train them would be in Telugu, but the only experienced WHP manager fluent in Telugu was located in Ahmedabad, Gujarat. WHP managed to rope in a Telugu-speaking retired engineer of the National Thermal Power Corporation (NTPC) residing in NOIDA as a volunteer. With the WHP support teams located in Faridabad, Haryana, Ghaziabad, Uttar Pradesh, and Delhi and the Andhra Pradesh, government's supervisors located in Amravati and Vijayawada and the participants connecting from various interior districts, a new model of training emerged. Despite the initial glitches, mainly due to the Internet connectivity, the training program got off to a great start. Within three weeks, WHP organized 56 training sessions where 792 health personnel (435 doctors and 357 assistants) were trained.

All the training sessions were recorded and later reviewed with the supervisors to incorporate revisions which would improve their quality. The supervisors also conducted random surveys post-training to assess comprehension so more attention could be paid to the difficult parts. Since WHP did not have resources to hire servers and trunk lines, the Andhra Pradesh government, which runs a state-of-the-art data

center in the state, stepped forward to provide these facilities. A technical team was appointed to coordinate with their counterparts in WHP so that all client-related data could be stored on the state-owned server. However, WHP had to maintain its application on its own server due to restrictions posed by use of third-party applications that did not allow sharing of the solution, under a contractual obligation.

The involvement of the Chief Minister not only provided a great impetus to the project but his willingness to spend political capital on the approach resulted in the project being launched as 'Dr. YSR Tele-medicine' with a five-digit easy to remember number (14410) which was specially obtained by the government to ensure that the transition in a fully owned system could happen without problems in due course. The Andhra Pradesh tele-medicine project was launched at a special function by the Chief Minister on April 13, 2020. A dashboard was created which provided a quick overview of the number of calls received, consultations provided, and the number of COVID suspect cases who received free medicines from government facilities (Fig. 3.2).

The Andhra Pradesh project, despite receiving less number of calls, provided more consultations due to the availability of the doctors and the energy infused into the system by the direct involvement of senior leadership. The project until it was administered by WHP received 66,900 calls in five months. Over 33,500 (50%) were for consultation and 1,873 suspects were identified. Besides medical consultations for common morbidities, general counseling was provided to patients wanting information on COVID-19.

Since WHP could not transition its application to the Andhra Pradesh team, an arrangement was made by which the WHP's team would provide the necessary support and guidance for the government's special team to develop a solution.
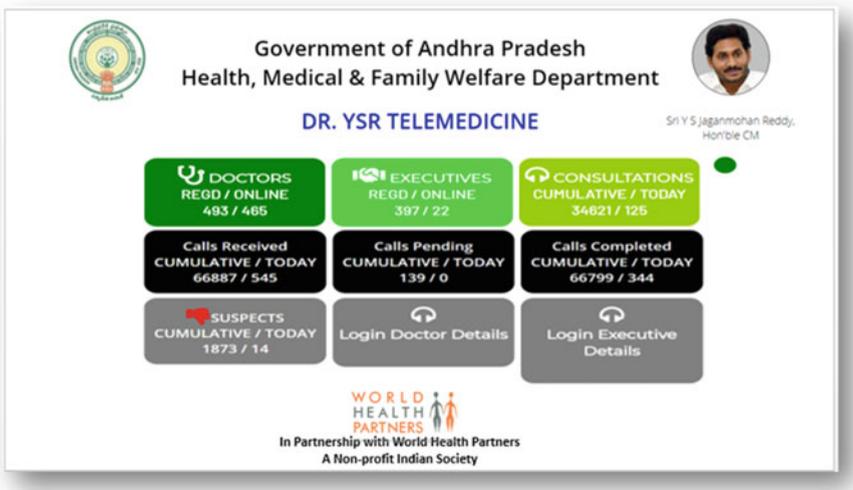
Fig. 3.2 Dashboard provided to state leadership to review project progress in real-time

Since the processes were already under implementation, the government team had an easier task of identifying suitable software which could be duplicated. WHP also referred various third-party vendors whose solutions it had used in its application to enable the Andhra Pradesh government to expedite the development of its own solution. This process was finally completed by August after which WHP took on the role of providing advisory support to the project that had been transitioned to the government.

An important positive outcome of this exercise was that the Chief Minister became interested in digitizing the entire healthcare delivery system in the state for which a special six-member committee was set up. WHP was invited to join as a member of the committee. It was a high-level committee that included as its members the Executive Vice Chairman of Dr. YSR Aarogyasri Health Care Trust; CEO Real-Time Governance Society (RTGS), the Director of Public Health and Family Welfare (DPH and FW), an external public health specialist with deep interest in digital health systems, and the additional Chief Executive Officer (CEO), Dr. YSR Aarogyasri Health Care Trust.

Comparison of the Bihar and Andhra Pradesh Projects

While the Bihar and Andhra Pradesh projects were started almost at the same time during the nationwide lockdown, the Andhra Pradesh project showed better results in comparison with the Bihar project. Table 3.1 shows that the number of consultations

Table 3.1 Number of calls and consultations in Bihar and Andhra Pradesh

Month	No. of calls received	No. of consultations completed	COVID-19 suspects identified
Andhra Pradesh			
April'20	16,147	10,083	286
May'20	24,924	10,785	129
June'20	10,799	5725	108
July'20	11,620	3976	571
Aug'20	3397	2941	779
Cumulative	**66,887**	**33,510**	**1873**
Bihar			
April'20	33,820	4170	23
May'20	84,818	8798	37
June'20	3256	2400	60
July'20	1463	940	37
Aug'20	2862	1101	115
Cumulative	**126,219**	**17,409**	**272**

in Andhra Pradesh was significantly higher than the number of consultations in Bihar even though Bihar received more calls.

Phase-Out

The Andhra Pradesh state government made all the arrangements with its own resources and also developed an application in coordination with the WHP team. The entire system of caring for patients remotely was transitioned smoothly by August 2020. WHP continued to provide advisory support but was not involved in operations.

The Bihar project took its time. Since WHP had run out of resources, it requested the state to take over the solution as had been done in Andhra Pradesh or allow WHP to close down the project since the government facilities had started functioning on a normal schedule. This permission was finally granted on October 19, 2020, which enabled WHP to close its emergency operation in Bihar on October 20, 2020.

Chapter 4
Unveiling the Clinical Face of COVID-19

Arti Singh and Ashutosh Singh

Abstract The clinical aspects of COVID-19 are discussed. A picture of what happens in a hospital—the ward and the intensive care unit (ICU)—is described. The impact of the disease on patients, medical professionals, and other staff, and case studies of patients who recovered as well as those who did not, are presented. The lived experience, over the ten-months period of the pandemic, of these individuals is portrayed.

The lived experience of the author and that of her team is portrayed from the inception of the pandemic to date. The author traces changes made to diagnose and treat COVID-19 patients over time. Patient treatment and management regimens were refined and streamlined during this period. And the health system was re-designed to cope with the influx of huge numbers of COVID-19 patients. During this time, diagnostic tools and treatment regimens evolved. Doctors and their teams of nurses and technicians worked tirelessly day and night to cope with the onslaught. The public, however, stigmatized healthcare workers as they were overcoming with the fear of getting infected.

Ten months ago, the medical profession knew very little about the virus or the disease as both were new. But with its dedication and commitment, the medical fraternity managed to cope with the rising number of patients with whatever tools it had. This period witnessed a rapid learning curve.

Introduction

It was a pleasant afternoon on March 12, 2020. I had traveled from Bhopal to Mumbai to attend the graduation ceremony of the final year batch (my son being one of them) of the Lokmanya Tilak Municipal Medical College. This was when I first came to

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know that COVID-19 was spreading fast in some countries and had been declared a pandemic by the World Health Organization (WHO) just a few hours back. By that time, only 73 patients had been diagnosed with COVID-19 in India. As this information was sinking in, I began to visualize its impact. I had read about such pandemics but had never faced one.

As I looked around, before me was a batch of ecstatic smiling faces of young people who had just passed their M.B.B.S. and were about to be awarded their hard-earned degrees. The faces of their parents shone with pride. No one, including me, could ever imagine that in less than a month, these smiles would be hidden behind masks and face shields. And the pride in the parents' eyes would be replaced by concern and fear for their children.

Early days

Coronavirus is not a single virus. It is a part of larger family of viruses that have existed for a long time. Several known coronaviruses circulating in animals have not yet infected humans. Of the various categories of coronavirus, the beta coronaviruses are known to cause severe disease in humans like Severe Acute Respiratory Syndrome (SARS) in 2002–03, the Middle East Respiratory Syndrome (MERS) in 2012, and now, COVID-19. Coronavirus is the name of a family of viruses. The specific virus in the present case is Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2), and the specific disease is named coronavirus disease-2019 (COVID-19).

Soon after the first lockdown was announced, people all over India tried to stock whatever they could as coming times were unpredictable. Doctors and other health-care workers (HCWs), however, did not know 'what to stock' in the hospitals and clinics. The medical fraternity suddenly found itself on the frontlines of a battle with an unseen enemy, with no weapons in hand. As I look back, when the first few COVID-19 patients came into our hospital, I realized that the system to deal with them was still in a very nascent phase. The primary focus of top-level teams who were working day and night to develop protocols for handling COVID-19 patients was not only to treat them, but to prevent other patients and HCWs from getting infected. The disease was found to be highly infectious with a Ro (reproduction number) representing transmissibility of 2.5, which is significant. Patients suffering from a variety of infectious diseases attend out-patient departments (OPDs) in India. But such high and rapid transmission has not been seen before by my generation of doctors. Personal protective equipment (PPE) was a foreign word for most doctors. We had only seen it in Hollywood movies. A sense of helplessness in dealing with sick COVID-19 patients, combined with the fear of getting infected, was visible on the faces of all doctors.

The Incipient Phase: Addressing the Unknown

The day when I was informed about the first few patients of COVID-19 in our hospital, before leaving for work, I took off all my jewelry, tied my long hair in a high bun (which I had never done before), and searched for a dress which was easily washable and compatible with PPE. Fancy footwear was replaced by all cover boots. Gone was my favorite leather purse. It was replaced by a washable plastic bag that was filled with masks, sanitizers, eye tight goggles, throwaway pens, and a face shield. At that time, like everyone else, I thought that these adjustments would be necessary for only a month or so.

I now laugh looking back at the apprehension I had while encountering my first COVID patient. My first COVID-19 positive patient had to wait for fifteen minutes as I struggled to get myself into my first PPE kit. It was like doing my first surgery—the nervousness and anxiety, and the fear of failure. Those were the days of many 'firsts' for doctors the world over, as the disease and its management were new. But one thing that was not a 'first' for them was a strong will to deal with whatever they were faced with.

Since that day in March, my mobile phone has not been switched off at night lest my team needs me for an emergency. I wonder how I managed to remain alert all night. It was very similar to a new mother's experience. The mother is aware of her limited knowledge and experience and the unpredictability of her baby. She knows that the only thing that stands between her baby and a catastrophe is her alertness. Armed with the basic knowledge of dealing with infectious diseases and having read some literature on COVID-19, my staff and I began to treat patients with all grades of severity as they started coming in large numbers into our hospital. We gradually started to rein in the disease by our determination. We also started to understand the disease better.

Clinical Presentation

'When I had a mild fever and a running nose, a few hours after my evening walk, I attributed it to not covering myself properly as it was a cool evening. But I soon started having chills and felt feverish. I could have easily overlooked the problem had there not been severe body aches that night. Knowing that I had been a little careless recently, I went for a COVID test the next day— with fingers crossed. But unfortunately, my report was positive. It has been a month now but I still continue to have joint pains and fatigue, and I suffer from a lack of concentration. My advice – it is a bad disease. Be vigilant. Avoid getting it'.

Ashutosh, a mild COVID-19 recovered patient.

Patients with COVID-19 were present with a very wide variety of symptoms including fever (90%), dry cough (75%), shortness of breath (50%), extreme tiredness, body ache, generalized or localized pain in the back or limbs, throat irritation, nasal congestion, and loose motions. Loss of smell and taste are also commonly seen symptoms, usually found in the early phase of the disease. The transmission of the disease from person to person commences in the incubation period (the period between infection and the first symptom), two to three days prior to the onset of symptoms, which on average lasts for fourteen days. Some less common presentations include signs of heart or kidney disease, skin rashes, vomiting, acute chest pain, and paralysis. Symptoms of late presentation, seen mostly in older people, are acute breathlessness, disorientation, and drowsiness due to hypoxia (low oxygen levels in blood) and at times, acute pain in the limbs due to blood clots. 'Happy hypoxia' is an interesting term. However, there is nothing happy about it. This situation is commonly seen in COVID-19 patients in whom the virus works its way down the throat and into the lungs. The oxygen saturation of the body starts to decline, but the patient does not have any symptoms of breathlessness and keeps doing his routine work. It is only when saturation drops significantly that symptoms of breathlessness and giddiness appear, and this may be too late. To counter this situation, it is important to check SpO_2 levels (oxygen saturation) in older people with a pulse oximeter at regular intervals.

It is a common dictum in medicine: 'Your patient is your best teacher. Keep learning by his side.' Never had I given this dictum its due credit until COVID-19 taught me to do so. I learnt more about the disease as the footfall of COVID-19 patients increased in the hospital. Amazing hard work by research teams, clinicians, pathologists, scientists as well as government support machinery has, within a period of ten months, resulted in us having considerably more knowledge for managing COVID-19 patients than we had in April 2020.

The Problem of Late Presentation

Late presentation is most commonly seen in older patients because of medical and social reasons. They have co-morbidities (associated pre-existing diseases) and a compromised immune response which masks symptoms like fever. Many a times, vague symptoms such as body ache, fatigue, and loss of appetite are attributed to old age and, therefore, ignored. Such patients reach the hospital when they already have moderate to severe lung involvement. Treatment is, therefore, delayed, and as a result, complications set in. Some of these patients are in need of ventilators as soon as they arrive. Therefore, this group of the geriatric population needs extra attention at home. Their temperature, pulse rate, and oxygenation should be routinely checked.

Another high-risk group presenting late is healthcare workers, especially doctors and paramedical staff. They have a higher case fatality rate (17%) as compared to the general population (2.5%). Young, dynamic resident doctors work day and night on the frontlines treating COVID-19 patients in the wards and in the intensive care

units (ICUs). Many doctors have lost their lives because they presented late which itself is quite ironical.

To really understand this irony, you have to spend a day with a resident doctor in a government hospital, as no words can describe a classic vignette of a resident doctor's life, his hectic schedules, and his superhuman efforts. During their training, it is engraved in their minds that as the disease does not differentiate between day and night, young and old, white, and black, and caste and creed, they too cannot discriminate. For these resident doctors, there is no 'start of the day.' It could be 2 o'clock in morning or 11 at night. They barely remember when they got six hours sleep or when they were able to take a bath. The demanding hours of work and exhaustive training of these doctors are exceptional.

Though not every medical student before entering this profession has such focused dedication, the journey of learning the art of healing and the sense of responsibility evoked in young minds while attending to an ailing child or a dying human being play an immense role in inculcating self-discipline and commitment. This makes them work night and day without stopping to realize what their tired bodies are trying to convey. Pre-COVID, this was still doable. But in the COVID era, these doctors themselves fall in the vulnerable group. When infected, they often attribute their symptoms of fatigue, body ache, mild fever, and cough to the lack of rest, sleep, and nutrition. This neglect has taken its toll. We have lost many young doctors due to COVID-19.

Like any other disease, a COVID-19 patient with mild disease may progress to a moderate or severe phase. COVID-19 maintains its mystique by virtue of its unpredictability. While most patients steer safely through the 14–21 days of the disease, others deteriorate suddenly. Medical science still does not have definite markers to predict which patient will worsen suddenly. The silver lining, however, is that in India only 5% patients turn critical, 14% fall into the severe category, while 81% suffer a mild disease. The mortality rate continues to be below 2.5% in India.

As we navigate through the pandemic with more resources in our hands now as compared to earlier months, the availability of personal protective equipment (PPE) has become inversely proportional to the personal protective awareness and attitude (PPA). With passing months, people have become less fearful and more careless about following simple methods of protection. A new term, 'COVID fatigue,' has been coined to justify people's attitudes. Public places are getting crowded with unmasked youngsters. What they need to know as responsible citizens and family members is that they themselves might come out of the disease with minimal damage, but they can transmit it to elders at home costing them their lives.

Streamlining the System

After the Indian Council of Medical Research (ICMR) and the Ministry of Health and Family Welfare (MoHFW) developed guidelines for hospitals, specific areas were earmarked for COVID-19 emergencies. COVID wards and COVID intensive

care units (COVID ICUs) were set up, and doctors were deployed in each of these facilities. Efforts were made to provide the latest treatment for patients and protective gear for HCWs. However, there were many teething problems. Because of the sudden influx of large numbers of COVID-19 patients demanding attention and resources, non-COVID patients suffered. All specialists were engaged in COVID care and could not attend patients with other diseases. Despite all efforts, mixing of COVID and non-COVID patients could not be completely prevented in some areas like emergencies, pharmacies, and to some extent, in medical out-patient departments. As the transmission modes were still under study and it was not very clear whether COVID-19 is airborne or spread by droplets, staff deployed in the COVID units were fearful about their own safety.

As doctors, we have faced many emergencies before this pandemic—accidents, riots, the infamous gas tragedy of Bhopal, and many more. In those times, when I returned home from the hospital, the pride in the eyes of my loved ones took away all my pain and fatigue. But now, returning home is very different. I can see anxiety and fear in their eyes. As I step out of my car, I am worried about carrying home infection from the hospital. I keep wandering if I washed myself sufficiently or 'Did I touch something while entering home?' I worry about where I should put my bag or my keys. I wonder if I could let my sons hug me as before. I wonder whether I should sleep in the corner of the bed or in the sofa in the living room. But despite this dilemma, next morning I wake up determined to deal with the challenge of COVID-19.

As time went on, systems started getting streamlined. Today, hospitals are much better organized and equipped for COVID-19. As is mandatory 'fever clinics' have been set up in all hospitals for suspected COVID-19 patients. Right at the entrance, after preliminary checking of symptoms—temperature and SPO_2 (oxygen saturation in the blood)—suspected COVID-19 patients are directed to the fever clinic. Thus, non-COVID patients who have other medical conditions are able to consult their specialists. It is good to see that even the smallest of the private clinics are following this system, thus avoiding mixing of patients. Emergency units in hospitals are now implementing a new concept of triage and holding areas. In some hospitals, suspected COVID-19 patients as well as all incoming patients are tested for COVID-19. They wait for the test report to come in. They are then segregated into COVID and non-COVID areas. COVID patients are sent to wards or intensive care units (ICUs). Healthcare workers in the hospitals form COVID teams comprising doctors and paramedical staff including nurses and various technicians (ECG, X-ray). A roster is worked up for rotation of teams in the COVID area, thus ensuring justified use of their services. In most of the hospitals, all planned surgeries are done after testing for COVID-19 with required precautions for doctors and patients. Hospitals that treat COVID-19 patients fall into three categories as shown in Table 4.1.

In order to break the chain of transmission of the disease, the government has earmarked quarantine centers to isolate COVID-19 positive patients without symptoms. Schools, stadiums, lodges, hotels, and even grounds have been converted into quarantine centers. This differentiation had eased the burden on the health system.

Table 4.1 Type of facility admitting cases with different severity

Type of facility	Severity of case
COVID care center	Mild (without oxygen)
Dedicated COVID health center	Moderate (need oxygen)
Dedicated COVID hospitals	Severe (may need ventilator)

As disease prevalence soared and India went into the phase of community transmission, this black and white differentiation began to fade, partly because the availability of beds shrank in several hospitals, especially in the dedicated COVID hospitals (DCH). Currently, hospitals staff are managing both moderate and severe cases. This is because with increasing prevalence, more patients have started falling into a gray zone with the moderate and severe categories oscillating on either side during the course of the disease. Despite all efforts by state governments, a major practical problem being encountered in class B and C cities is the shifting back and forth of various categories of patients because of the scarcity of COVID-dedicated ambulances and basic life support (BLS) ambulances in the COVID pool. Regular ambulances cannot be used for COVID patients because of the risk of infection. Also, a rapid deterioration in the condition of COVID patients makes the shifting process risky. State governments have provided contact points to ensure bed availability in the hospitals, but once again, a large numbers of patients and work overload have hindered these measures. It is difficult to keep up with the pace of the spread of the disease. Many private hospitals have converted 20% of their beds into COVID beds according to the government's instructions and are admitting all categories of COVID-19 patients. Because of these reasons, differentiation in many hospitals into different categories of patients is not possible. And many hospitals in the country are now catering to all patients by setting up COVID wards and COVID ICUs.

Managing the Unmanageable

In the past ten months, a new virus with no known treatment took the human race by surprise. Developing countries like India faced unprecedented challenges. With more than nine million reported coronavirus cases according to the MoHFW, India is among the worst affected countries in the world. But if we analyze the prevalence of the disease in the light of India's population size, resources, diverse geography, and last but not least the *sab chalta hai* (everything goes) attitude of the general public, the disease may not have caused as much damage as expected.

A major cornerstone in India's strategic approach to the pandemic has been extensive testing. From only one laboratory—the National Institute of Virology in Pune—that tested for COVID-19 in January 2020, today the number of laboratories is more than 2000 all over India. From about 100 tests per day in March 2020, India crossed the landmark of 100,000 tests in a day on May 18, 2020. As of November 25, 2020, the total number of tests done was above 135 million. The importance of testing

cannot be stressed enough, because only timely detection can trigger the cascade of measures that follow including isolation, followed by treatment and management. With extensive testing and mass screening, cities in India have prevented the infection from exploding uncontrollably. A notable example is the large *Dharavi* slum in Mumbai.

Commonly used tests to detect coronavirus are reverse transcription-polymerase chain reaction (RT-PCR) with 70% sensitivity and rapid antigen testing (RAT) with 50–60% sensitivity. Other tests are COVID-19 enzyme-linked immunosorbent assay (ELISA) and chemiluminescence enzyme immunoassays antibody (CLIA) kits to detect antibodies against coronavirus indicating recent infection. Others are True Nat testing for COVID-19, cartridge-based nucleic acid amplification testing (CB-NAAT) and clustered regularly interspaced short palindromic repeats (CRISPR) technology base SARS-CoV-2 test. Molecular diagnosis or testing in real-time reverse transcription-polymerase chain reaction (rRT-PCR) test and reverse transcriptase loop-mediated isothermal amplification (RT-LAMP) assays are other diagnostics. Another important diagnostic and prognostic tool is computed tomography scan (CT scan) of the chest and to some extent X-ray chest. Many a times, a false RT-PCR negative case is diagnosed and treated successfully on the basis of the CT scan findings. There is also a battery of blood tests which are supportive of diagnosis and have significant prognostic values.

Medical science is an imperfect science, which means that two plus two is not always equal to four. An important part of the diagnosis and management of any disease is the clinical assessment of the patient. The treating doctor's interpretation, based on his/her knowledge and experience, is most important. Because of the limited sensitivity of the commonly used tests (RAT and RT-PCR) or at times, defective collection methods, many false negative reports are generated. A highly suspicious case, even if she/he has a negative RAT or RT-PCR report, should be managed as a COVID patient on clinical grounds. It is wise to go with the judgment of the treating doctor about the management of the patient, as many are detected positive later on. Another conflicting feature is that many patients are found to be persistently COVID positive due to the shedding of the dead virus but are usually non-infective beyond 12–14 days.

As the months pass by with no signs of relief from the pandemic, the biggest challenge in hospitals now is how to adequately staff the various COVID areas with doctors, nurses, technicians, pathology and radiology staff, class-IV workers, and administrators. As COVID-19 is predominantly a respiratory disease, its treatment strategy and planning fall into the purview of chest physicians, general physicians, intensivists, and anesthetists who form the core team for fighting COVID-19. COVID-19 has further reduced the already low doctor patient ratio in India. The physician to patient ratio is 0.7:1000 in India as compared to 51:1000 in Sweden.

Despite the patient overload, the medical fraternity stood up to the occasion and doctors from all specialties like ophthalmology, surgery, and psychiatry offered their services for the fight against the pandemic. This fact is little recognized by the general public who have a tendency to take doctors for granted. Doctors work beyond the call of duty as they keep updating their knowledge on COVID-19 without creating

any fuss. This deserves recognition and applause. Orthopedicians, ophthalmologists, gynecologists, and surgeons, who had never entered the medical ICU, have taken a crash training course on ventilators and COVID patient care. The core COVID teams have carried out their duties willingly. While people are treating COVID patients as untouchables, nursing staff are handling these patients with benevolent compassion, recapturing the memories of Florence Nightingale.

Drug Management

There has been a rapid change in the pharmacological or drug management of COVID-19 over these past months. Hydroxychloroquine emerged as the most promising drug in the initial months. However, in June 2020, the Food and Drug Administration (FDA) revoked its emergency use authorization. Many other antiviral drugs came up of which Remdesivir was one of the more promising drugs approved by FDA. However, on November 20, 2020, WHO recommended that it should not be used. Oral antiviral Favipiravir was recognized in some countries including in India, but there are still limited studies on this drug. Ivermectin, an anti-parasitic drug, that has been used for a long time, is currently under trial at the All India Institute of Medical Sciences (AIIMS) in Bhubaneshwar where it has shown positive results for the prevention and treatment of COVID-19. As this viral infection evokes an inflammatory reaction especially in the lungs leading to complications, anti-inflammatory drugs like steroids and many inflammation marker tests have found a role in the management of COVID-19. 'Cytokine Storm,' a high mortality prognostic condition with a high risk of death, brought forward drugs like Tocilizumab. But again, this drug has its own potent side effects which are restricting its use. It has been found that COVID-19 induces the formation of blood clots in blood vessels leading to complications such as heart attack, paralysis (stroke), thrombosis in the veins of legs or kidneys as well as ischemia (lack of blood supply). The addition of anticoagulant drugs to counter this has brought a landmark change in the management of the disease. Convalescent plasma therapy with antibody-rich plasma from infected and recovered patients was used initially. But on November 17, 2020, it was invalidated by ICMR. Supportive treatment with vitamins C and D has also a found place in the treatment of COVID-19, but this is still under study. Vaccines to prevent COVID-19 that are being rolled out show a light at the end of the tunnel.

> 'Society cannot be left alone at a time when it needs us the most. Someone has to come forward and take charge. God gave me an opportunity to do this—to be with those suffering and to treat them. I have tried to give my best and this was possible because of the dedicated staff of 850 healthcare workers of Chirayu Medical College who worked fearlessly. The pandemic provided me

an opportunity to use my clinical skills to help mankind which has given me real satisfaction'.

Dr. Ajay Goenka, Director, Chirayu Medical College, Bhopal, a pioneer in COVID care.

India is a land with age-old Ayurveda, homeopathy, and other indigenous systems of medicine. Several indigenous treatment strategies have emerged for the cure of COVID-19. The role of black pepper, ginger, cloves, honey, lemon, and turmeric milk is well known in Ayurveda, yoga and naturopathy, Unani, Siddha, and homeopathy (AYUSH). A variety of '*kadhas*' (potions) are finding their place in management of COVID-19. To the best of my knowledge, none has proven to be fully effective. Meanwhile, exploring the world of indigenous treatments offered in our country is an interesting research-worthy subject. Traditional healing systems in remote areas of India offer nature-based lifestyles and treatment to combat the disease. Natural diets include organic fruits with high vitamins C and E and antioxidant content to strengthen the immune system to keep the virus at bay. Flowers of '*Mahua*' tree are being used by some in Odisha State to make antiseptic solutions. Some villages in Chhattisgarh State make natural sanitizers. In some villages in Odisha, a local herbaceous plant called *Bhui Neem* or King of Bitters is used to make a concentrate to fight the virus. *Ashwagandha* or Indian ginseng, *Giloy* branches, and many other medicinal plants are used by Indian tribes to ward off the virus.

The age-old practice of yoga with its various *pranayams* (breathing techniques) is gaining importance by virtue of its effect on the lungs. It can make those areas of lungs active which, in a non-practicing person, lie dormant. Based on the same principles, the Awake Proning or Coronary Artery Revascularization Prophylaxis (CARP) method is recommended in the West. '*Jal Neti*' and '*Sudarshan Kriya*' can also be added to the list of methods used for improving respiratory hygiene of the lungs.

The Hospital Scenario in COVID-19 Pandemic

During the lockdown and for subsequent months, the world came to a grinding halt. Roads became empty, and people remained indoors for safety. But the rules were different for doctors. Their leave was canceled. Their duty hours were increased. And their mental as well as physical pressures grew exponentially. Doctors are quite similar to soldiers in this war. But while a soldier functions better by suppressing his humane aspect, a doctor brings out his best by revealing his humane face. However, doctors fear that they and their families may get infected while they are trying to be dutiful and fearless. But then they push back all their worries and start each day with a new hope and strength. Armored with knowledge about the disease, which they gained during the previous night by attending seminars on COVID-19 and by reading

recent protocol updates, doctors boldly enter the COVID areas of the hospital for their day's work. The ritual of meticulously donning PPE gear is tedious because they have to stay in this gear for the next 6–8 h when they cannot get any food, drink, or a bio break which can be difficult.

The practice of taking rounds and prescribing treatment is the technical aspect or 'the science of medicine.' COVID-19 has incapacitated the doctor–patient relationship—'the art of medicine.' What does a patient look forward to when a doctor comes for his rounds? Is it the intravenous fluids planned for him or his intake–output chart or incomprehensible names of medicines? No, certainly not. The patient is searching for some assuring words, a hopeful smile, or a comforting hand to hold. The PPE gear has suddenly taken away this assurance from him. It is the same for a doctor who hides behind his impermeable veil, compromising 'the art of healing.' He can only reveal his identity to the patient through his voice, which is also muffled behind layers of the protective mask.

For a patient who is conscious, the atmosphere inside a COVID intensive care unit (ICU) can be scary. Within a closed room, he is inside a small cubicle full of gadgets—constantly beeping machines and monitors with flashing graphs and numbers. Within his visual range, there are some more serious patients and a few faceless and expressionless figures of healthcare workers wearing PPEs. There is a constant wheeling in of sick patients suffering from the same disease as him; some of whom are dying before his eyes. Intubations are going on, sounds of running ventilators are frighteningly monotonous, and healthcare workers appear like white robots moving around. The only other event that happens during the day is a brief interaction on video with his family, which incidentally is also the only activity connecting him to the passage of time because days and nights are otherwise indistinguishable in the ICU. Once in the ICU, the average time for a patient to be fit enough to be wheeled out is seven days. During these nerve-wracking days, the patient feels that he would give anything to see a normal smiling face or meet his dear ones.

For a doctor on duty in the COVID ICU, life is very different from the pre-COVID days. Over the years, protocols have been developed for all other medical emergencies, and doctors are confident that they can get positive results. The course of events in most of the diseases is predictable. But COVID-19 is still unpredictable. The case fatality rate in ICUs all over the world is around 50% which is much higher than in India. In some cases, the fatality rate is more than 90%. Even with the latest information and drugs in his bag, when complications set in, a doctor struggles in a maze of contemplation as she/he is unable to determine whether the problem is a complication of COVID-19, a drug reaction, or something else which is, as yet, not understood.

Wearing PPE is arduous for the doctor. There is physical restriction as well as heat and sweat due to lack of air circulation especially in the ICU where, by COVID protocols, air conditioners cannot be run. PPE hampers communications with patients as well as with fellow doctors and nurses and so work slows down. Emergency handling of patients, intubations, and intravenous catheterizations, which were routine earlier, are now painfully tedious. The doctor finds himself unable to connect with the patient in the traditionally taught ways. The suffocative feeling of multiple layers of the

mask distracts him from the much-needed focus and mental alertness required while working in the ICU. He is in command of and responsible for the multiple machines that are pumping life into moribund patients. Any mental clouding can be disastrous. But beyond his own fears and discomfort, he knows that if anything stands between the patients and death, it is him. This keeps him fueled for action. Once out of the ICU, he has to go through the risky ritual of taking off the PPE. This is risky because improper removal of PPE is a common cause of acquiring the infection. Another patience-testing activity is dealing with hyper-anxious family members of the patients. COVID-19 is known to cause psychological disturbances because of isolation. This is called ICU-induced psychosis. It can make patients say or do things which frighten their family members who watch them on video calls for a few minutes that are allowed in some hospitals. This precipitates anxiety and restlessness in the family which also has to be dealt with by the treating doctor. The reassurance given to the family has to be in guarded words as COVID-19 is known to take unpredictable turns.

For senior consultants in hospitals and in private practice, the day is spent managing COVID areas, attending to non-COVID patients, taking administrative decisions for streamlining and revising COVID care, and supervising the execution of extensive paperwork needed as per government policies. These pressing schedules that have continued for many months have resulted in mental and physical pressure and are taking a toll on the medical fraternity who is exhausted and in dire need of rest.

'My lungs were 90% involved and I was on a non-invasive ventilator for five days and then on high-flow oxygen for five days, all inside the ICU. I was unable to move my body because of extreme weakness. I was also disoriented and sleepy most of the time. A young nurse who looked after my needs also took care of the man in my neighboring bed. I heard him promising to get her married to his son because she looked after him so well. But the next morning when I woke up his bed was empty. The reason was obvious. I saw more people dying than my sick mind and body could take.

I would wait for my doctor whom I recognized, despite his PPE, because he was the only one who called all the patients by their names, otherwise we were just bed numbers. The big wall clock did not seem to move at all. It was very difficult to keep sane.

When I was moved to a ward, my neighbor was a lady whose husband was in the ICU. Her son was in the USA and was expected to come in three days. Her husband died that night and was cremated without any family members around. She was probably not told about his death.

I did not know when I will recover from post-COVID weakness physically, but I know that I can never be the same person emotionally'.

A 74-year-old severe COVID recovered female patient.

Healthcare workers also need the community's compassion and support. Thinking of one's own interest can be acceptable, but thinking only of one's own interest cannot be justified. Those who are facing the pandemic head on, deserve respect and encouragement. This is the only expectation of the frontline workers—which is really nothing in return for what they are doing for society.

> 'I have personally experienced very disturbing behavior on the part of my neighbors. They would greet me from afar during my walk in the common park. They would change their path when they saw me approaching them. My cook was urged by many to quit her job lest she gets the infection. I have read news about doctors being shunned in their neighborhoods and not being allowed to enter their own flats. Such estranged behavior and response by society for whom, we are risking our lives, working day and night, is extremely discouraging and pathetic'.
>
> A female doctor in Bhopal.

The Diary of a Patient

Since March 2020, everyone in the world has lived under the constant fear of getting the infection. Over the past ten months, the response to the prescribed precautions of sanitizing, masking, and social distancing (S-M-S) has been erratic. Financial and work pressures and the setting in of 'COVID fatigue' in society have made many careless. But even those following the rules to the best of their capacity have been infected. Immediately after being tested positive for COVID-19, the person is isolated. Before the situation sinks in, she/he is directed to an isolation room by government officials and/or by family members. The patient cannot even choose his/her clothes to pack. Basic essentials are kept outside the room to be picked up when no one is close by. The person suddenly realizes that no one wants to come close to him/her. If admitted to a hospital, she/he sees only PPE covered bodies of healthcare workers and misses the reassuring smile of the doctor, the comforting touch of the nurse, or a chitchat with the ward boy. Solitude is definitely the worst experience of an asymptomatic or mildly diseased patient. Solitude plays strange games with the psyche; 90% of patient detest this experience.

In the initial months of the pandemic when someone tested positive, all his/her family members were sent to different hospitals based on the category of their disease. Indian patients are not used to remaining alone in the hospital without the care and presence of their family members and friends. And if quarantined at home, the poster declaring COVID-19, the barricades around the house, and the stigma of the disease can cause terrible embarrassment.

'I suffered from COVID-19 in the initial months probably because I reside in a densely populated area of Bhopal. At that time, isolation policies in Bhopal were very strict. I was sent to a medical college hospital. Next day, I came to know that my wife and my older daughter had also tested positive. They were taken to another hospital because their disease category was different. My 16-year-old daughter who tested negative, was left all alone at home. As we are a nuclear family, there was no one to take care of our basic needs. All four of us had to manage on our own without any family support. Fortunately, by the grace of *Allah*, we came out unharmed. But the social stigma, the pain of isolation, the fear for your loved ones, and the anxiety and uncertainty are just not worth it'.

A 56-year-old male resident of Bhopal.

No matter how impatient and agonized you feel on not being by the side of your sick mother, wife, or child, you cannot see them. You cannot hold their hands. You just get a message, once or twice in a day about their worsening condition, and you can do nothing about it. If unfortunately the patient dies, she/he dies all alone without the family by his/her side. The body is wrapped in an impermeable double body bag by trained workers. No relatives are allowed to handle it. Depending upon the local administration, relatives may be allowed to see but not touch the body for one last time before it is taken away by the *Nagar Nigam* authorities for cremation. This scene is perplexing and upsetting. A dead body can be wrapped and closed in an impermeable bag, but human emotions and memories of a lifetime cannot. Emotions are high and spill over, turning into wrath against medical personnel, who are already terribly stretched in their fight against the disease.

A Doctor's Perspective

How many of us have visited a hospital, especially a government hospital, in the past ten months? The striking difference is that now it is almost impossible to recognize your treating doctor. All of them look the same as they are dressed in operation theater (OT) scrubs. Scrub caps on the head (gone are all hairstyles), double masks, gloves and if, you catch them off guard with their masks down, you will see a classical skin abrasion mark on the nose bridge which is because of their constantly wearing tight masks.

During their COVID duties, doctors do not go home for as many as fifteen days, lest they carry infection to their loved ones. Young mothers leave behind their toddlers to take care of COVID patients. Life in PPE kits, continuously for eight to ten hours, without food, water, or urination, is inconceivable. In the initial months, the policy was to assign COVID duties for 15 days followed by a week of quarantine to ensure that the doctor was COVID-free before the next duty rotation. In this way, doctors

could snatch some rest during the quarantine week. But with the spread of the disease, even quarantine breaks were denied to them. It is not that the doctors are not afraid, like all others when they enter COVID ICUs or handle emergencies. But one thought that keeps them going is 'Who will do it, if not me?'. Yes, it is understandable that this is a war situation, and a soldier's foremost duty is to fight. But unfortunately, in this war, the enemy is unknown, the weapons are crude, and training is hurried and insufficient. Doctors know that every day when they go home, they carry a risk of exposing their family members to the disease. Lately, contrary to the general perception, the footfall of sick patients in hospitals has shown an unexpected rise. This poses a serious challenge to the healthcare workers who are already very fatigued.

> 'People are becoming casual about COVID now. When the numbers were not so high, people were extremely cautious. Now when the numbers have increased, only a few will get very sick. But nobody knows who will be among those few. We see critical patients daily and so feel scared. I wish everyone was scared enough to take appropriate precautions. Hopefully, COVID will go away soon and we will fly into a COVID-free life. Until then, however, do not loosen your seat belts. Keep on a good mask and be safe'.
> Dr. Ashwini Mahlotra, Chest Physician, Bhopal—an active COVID warrior.

The irony is that at times COVID duties are safer than non-COVID duties because in the former case you know that all the patients are positive and so you take adequate precautions. But in the latter case, any emergency patient you handle could later turn out to be positive.

Doctors from different steams of specialization are missing their original work for almost a year now. Refining of specific skills and knowledge in their own fields has nearly come to a standstill.

Despite their undaunted determination and superhuman efforts to confront this deadly disease, the number of cases of violence against doctors has increased. As the country is opening-up, the plight of doctors, due to an unmanageable number of COVID-19 patients, is worsening. The number of healthcare workers getting infected by the disease is increasing. Fatigue has set in in the remaining fighters due to inhuman working schedules. But the sense of responsibility and the will to serve are still clearly evident.

In many areas, doctors are now practicing holding hands, i.e., being in touch with home quarantined patients through tele-consultations and tele-medicine, to guide them safely through the crisis. The only wish of healthcare workers is that people become more responsible and understanding and have compassion for those trying to help them for it as they who stand between them and the deadly disease.

Salient Takeaways

1. Until such time when there is a definitive cure for COVID-19, prevention is the best solution.
2. Do not take the disease or its symptoms lightly. To underestimate the severity of COVID-19 is a big mistake. The unpredictability of the disease, its high rate of transmission, and its variable course in different individuals are major challenges.
3. Early detection and consequently early treatment are the best choice for full recovery. Do not hesitate to get tested at the earliest, even if your cough and fever were mild and lasted for only two days.
4. A negative test report is no guarantee for a disease-free state. Reasons for false negative reports are multi-fold like low test sensitivity (60%-85%), improper sample collection, defective viral transfer medium, or a break in the cold chain.
5. If in home isolation, follow the instructions for treatment that your doctor has given through tele-consultation as the disease is known to take ugly turns anytime during its course. Trust your doctor who advised investigations as they are necessary. Have a positive frame of mind and a strong will to fight the disease.
6. People who start working immediately after recovery are likely to suffer post-COVID syndrome. In this case, there can be persistent breathlessness, cardio-vascular problems, stroke, and continuing fatigue. It is, therefore, advisable to take rest following COVID-19.
7. Do not let down your guard after the recovery period. The immunity status has been found to be variable both in strength and duration. Reinfection or a new infection with other viruses or bacteria can occur due to low immunity.
8. If you are COVID positive, do not hide your status. Do not be the one to transmit the disease. Stay indoors and away from everyone.
9. Learn to wear your mask properly. Change it frequently as soiled masks are not protective. Follow social distancing and sanitizing protocols available on government websites.
10. Multiple disciplines and agencies are working resolutely to save lives. They are working fearlessly day and night. Healthcare workers, the police department, government officials, social workers, and many others are on the forefront of the pandemic. Be patient and show them gratitude and respect.
11. The world is talking of a 'new normal.' During the Spanish Flu in 1920, same precautions and steps were proposed to contain the pandemic. We did not then prepare for social, environmental, and behavioral change to manage the ecological balance. Understanding this and adapting to the real 'new normal' are important for preventing future pandemics in this era of globalization.
12. Keep yourself updated with new guidelines and instructions issued for the public on various government Web sites and keep away from rumors.

'***Hum naa marab, marihe sansaara***,' a well-known Hindi saying by *Sant* (Saint) *Kabir* states that things can go wrong only with people around him, but never with himself. COVID-19 has shattered this belief. Starting from Wuhan and reaching our homes in just a few months, this disease has left an imprint on the ever-growing selfishness of human beings. If you want to be safe, care about others and create a safe environment for all.

'***Ubuntu***' is an African tribal word which means 'I exist because we exist.' It is impossible for you to be happy when everybody else around you is sad. So, let us join hands to bring about a change for everyone together… for a better tomorrow.

Chapter 5
The Twin Epidemics: TB and COVID-19 in India

Check for updates

Chapal Mehra

Abstract COVID-19 has disrupted the health systems in low- and middle-income countries and has consequently unleashed a global health crisis. The lack of preparedness is visible at multiple levels of the healthcare system in India. The health system is overwhelmed by the influx of COVID-19 cases, dislodging all other patients. An inadequate healthcare infrastructure with less than optimal human resources along with a rising case-load and serious supply chain disruptions, has resulted in fatigue, frustration, and anger among the health workforce on the one hand, and in an atmosphere of fear among the patients and healthcare workers, on the others.

The media is filled with messages on the COVID-19 crisis. Forgotten in the hyperbole is that numerous other diseases continue to devastate India's population. Of these, the most important is TB. India continues to bear the highest burden of TB in the world accounting for an estimated 2.8 million cases every year and killing more than 400,000 persons annually. TB kills 1,200 Indians every day.

The symptoms of COVID-19 and TB are very similar. Both are respiratory airborne diseases. Both diseases are heavily stigmatized. And both are associated with mental health problems. Gender disparities are apparent in TB and COVID-19, but the gendered aspects of these diseases is ignored in programming. The author argues that for all these reasons, these two diseases should be addressed in tandem. It is time to fight COVID-19 and TB just as it is time to invest in public health.

Introduction

COVID-19 has disrupted life across India as we know it. Controlling the pandemic has impacted other health services and comorbidities of which tuberculosis (TB) is the most significant. With similar clinical symptoms, TB and COVID-19 present a deadly mix for India's health system. TB, though curable, remains India's severest heath crisis killing over 1200 Indians every day. TB services have been widely disrupted leading to delays in diagnosis, treatment, access, increased suffering, and mental

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health problems in those affected. The author examines the impact, implications, and possibilities that exist for addressing these twin epidemics. The lived experience and narratives of TB-affected individuals are examined. Systemic challenges are documented. And, alternatives and ways ahead to address these epidemics together are explored—as India and the world comes to terms with living with COVID-19.

The Emergence of COVID-19 and Its Impact on Health Care and Populations

Toward the end of 2019, news from China revealed that infection with a novel coronavirus was resulting in pneumonia cases in Wuhan city [1]. While unexpected and unnoticed, it spread alarmingly resulting in an epidemic throughout China. As the world came to grips with its lack of understanding and knowledge about the virus, new cases began emerging globally and soon an ever smaller, connected, and globalized world became even smaller and more vulnerable as it grappled with an emerging global public health crisis. Recognizing the growing pandemic in February 2020, the World Health Organization (WHO) designated the disease as COVID-19 which stands for coronavirus disease 2019 [2]. The virus that causes COVID-19 was designated severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).

Several months later, the world is reeling under this unprecedented pandemic, and science and understanding of COVID-19 are still evolving. Interim guidance has been issued by the WHO and by the United States Centers for Disease Control (CDC), but the world is only slightly better prepared to face this pandemic [3, 4]. Our understanding of transmission has improved, but COVID-19 remains largely incurable. It was initially thought that certain drugs such as Remdisiver may be effective in addressing some of COVID-19's complications and reducing mortality. This, however, was disproved by the recent results of the Solidarity Therapeutics Trial [5].

Globally, about 37 million confirmed cases of COVID-19 have been reported [6]. This number is believed to be an under-estimate. Based on sero-prevalence surveys in the United States and Europe, this figure may be much higher if we account for potential false positives and false negatives. In countries across the world, the overall prevalence is expected to be much higher as the number of cases is a function of the testing done [7].

The world and countries like India are reeling under the growing COVID-19 crisis as it threatens to destroy lives, economies, and even global trade [8, 9]. Countries have been forced to look inwards. But while the impact on global trade, and hence on long-term global incomes, is yet to be adequately understood, the outcomes of the disease seem devastating. The World Bank estimates a baseline forecast envisioning a 5.2% contraction in global GDP in 2020. This indicates the deepest global recession in decades, despite the efforts of governments to counter the downturn with fiscal and monetary policy support [10].

Impact on the Health System and the Population

COVID has dislodged the entire health system in low- and middle-income countries (LMICs). Its impact has been felt more severely and acutely in LMICs as in these countries health system infrastructure is weak, overburdened, and fraught with limitations. Alongside, several health crises have been persisting resiliently in countries like India and other LMICs.

Clearly, the health system has been caught largely unprepared for this crisis [11]. Its impact has been significant across the system in both the public and private sectors [12]. The crisis has exposed the inability of the health systems in the LMICs to cope with an epidemic of this magnitude [13]. What has also emerged is the inability of these countries to simultaneously address pre-existing health challenges and programs on an ongoing basis. Hospitals, health centers, and clinics in many cases, already overburdened around the world, have been further impacted by the increasing influx of COVID-19 patients—dislodging all others.

The pandemic has unleashed one of the most complex global health crises in recent history which has exposed the lack of health system preparedness. This lack of preparedness is visible at multiple levels where it has systemic [14], organizational, human resource, and capacity-related challenges [15]. At a deeper level, these are political and represent, in several LMICs, a neglect of investment in population health [16] and a lack of democratic accountability.

There are also clinical and research challenges, and the capacity to address these is limited. At a fundamental level, there are deeper ethical and moral challenges. And, strategies for managing population health are less prevention-led and more treatment-led [17, 18]. This is evident in the large-scale neglect of the social determinants of health in countries like India where there is a lack of health system preparedness and poor infrastructure [19–21]. There has been an apathy to address the more fundamental population health problems. Thus, there are short-, intermediate-, and longer-term challenges which have been exacerbated by the crisis.

A single strategy seems unworkable to respond to this crisis. Clearly, different strategies and evidence-based perspectives are needed. These need to be from multiple disciplines including health research, public health, epidemiology, sociology, behavioral sciences, management, and economics. What is sorely lacking is the capacity of the health system. Managing the COVID-19 crisis is about integrating it intrinsically into healthcare governance [22]. We need to redefine our health planning, funding, and manpower strategies. COVID-19 has compelled us to re-examine our health system and also re-evaluate health services. We also need to ensure the accountability of the health system [23].

Challenges due to COVID-19 exists at the level of population health [24]. We are currently witnessing the short- to medium-term impacts of COVID-19. We have yet to adequately understand the long-term implications of its residual impact on cured populations [25]. There is also the immediate task of simultaneously addressing other health concerns of the population.

As health systems have put in efforts into managing this pandemic globally, they have diverted focus, personnel, critical resources, and points of access from several other prevention, health promotion, and treatment services [26]. This is combined with the perennial shortage of health workers in most LMICs and with panic, fear, and risk perception among populations. The outcome is that large numbers of people do not access healthcare [27, 28]. Most efforts are targeted to the pandemic and so many do not seek health care for their problems [29]. Essential service are not being used [30]. The capacity of the health system and, in particular, of government facilities has become a political wrangle among stakeholders because of the lack of hospital beds and intensive care units (ICUs) in India [31]. In some instances, the state has strengthened services with equipment and staff [32]. This, however, has not been a uniform phenomenon in all countries. The fear of COVID-19 has caused collateral damage. In the private sector, procedures such as coronary stents, knee replacements and others are not being conducted [33].

Insufficient healthcare infrastructure and human resources and rising case load of infections along with serious supply chain disruptions has resulted in fatigue, frustration, and anger in the health workforce and the clients [34]. It has also created an atmosphere of fear among patients and healthcare workers. This has led to stigmatization, compromised ability to provide in-patient care, and declining safety standards during the pandemic [35]. Another serious gap is the lack of reliable and adequate information. The lack of scientific facts and information on disease progression, and how we expect the disease to spread, has impacted country-level responses [36, 37]. This in turn has led to inappropriate community-level and individual-level responses and behaviors. The outcome is that this virus is defeating even the best prepared scientifically advanced nations resulting in an inadequate response of the health system at national and global levels. There has also been a significant negative impact on other health programs [38].

In India, the public sector and its resources are being pre-dominantly re-directed toward COVID efforts. Evidence of this is visible in the shortage of beds, doctors, and health workers. Perhaps the most impacted are the ongoing programs including immunization, women's health, cancer, and tropical diseases among others.

Immunization has been gravely impacted in India [39]. An almost unending lockdown ensured that the immunization programs in several regions were interrupted and continue to be so. It is the apprehension of many that around 80 million children globally and a substantial number in India are at risk of contracting diphtheria, polio, and measles. The numbers in India are yet to be modelled. The re-location of health workers for COVID-19 care in countries like India has led to immunization services being neglected and, in some cases, virtually stopped. Fear of infection has prevented people from pro-actively seeking immunization for their children. Where the impact of lockdowns is less severe, health workers are being re-directed to handle the pandemic by contact tracing, testing, and quarantining. It is unmanageable for them to also implement immunization programs [40].

Many cancer centers have reduced their services after initial reports from China that indicated that COVID-19 outcomes were worse among patients with cancer. In some cases, like the Tata Memorial Centre (India's largest cancer center), even

though operations were scaled down they continued to provide care. This, however, is not the case across the country [41, 42]. It is unclear whether this is due to increased susceptibility of cancer patients to COVID-19 or because they are more likely to be in contact with COVID patients due to their frequent hospital visits. These issues need to be evaluated.

Women's health has possibly been most compromised during the pandemic [43]. There are a combination of factors—social determinants, women's lack of agency, their inability to seek care, and a gender-unfriendly health system, particularly in rural India. Consequently, the incidence of caesarean sections is reported to have declined.

The private sector, which has been engaged in the COVID-19 response in India, has had both challenges and successes. The private sector is witnessing a loss of business, and this trend is expected to continue in the foreseeable future [44]. A significant section of its services has been redirected towards COVID-19 care. The anticipated losses and severe impact on cash flows are being turned into a possible revenue generation stream. There have been some reports of unethical practices in a bid to make up the losses. There is evidence that huge bills, often under unclear and misleading cost, are generated.

TB and COVID-19 in India

The COVID crisis is receiving significant media attention. Its impact has devastated our population, our economy, our freedom, and our minds. We are made to be believe that COVID-19 is our severest crisis [45]. Forgotten in this hyperbole is that numerous other diseases continue to devastate India's population. Of these, the most persistent and significant is tuberculosis [26].

Despite an extensive national program and a vast private sector, India continues to bear the highest burden of TB in the world, accounting for an estimated 2.8 million cases every year and killing more than 400,000 persons annually [46]. There is also a high burden of drug resistant TB (DR-TB).

The Impact of COVID-19 on TB in India

The TB program and has been badly hit during the COVID-19 pandemic [47]. On-the-ground investigations and reports reveal that both diagnosis and treatment have been affected. Drug-sensitive and drug-resistant TB patients were unable to access medicines. Until India ordered bidirectional screening for TB and COVID, diagnosis was suffering badly. This has put both diseases in jeopardy and has likely increased the transmission of infection. The lack of transportation has restricted patients' ability to access health centers to receive medical services and medicines.

Diagnosis

TB-affected individuals, especially those suffering from pulmonary TB, were not visiting laboratories and hospitals because they were frightened of getting COVID-19. Moreover, those advised crucial drug susceptibility testing (DST) were either not getting it done or, in several cases, it is not happening easily. Patients were also unable to collect their test reports. This is deeply problematic as TB notifications for new cases was falling consistently [48]. By some estimates, there are close to one million missing TB patients in India. This number will rise in all likelihood and become a challenge for case detection and initiation of early treatment [49].

Economics and TB

With the loss of jobs in an already slowing economy, patients and their families are getting desperate because of insufficient nutrition. Due to the lockdowns, consistent migration and losses in the informal economy, and food insecurity, nutritional levels are bound to fall which is likely to increase hunger. This will have a long-term impact on immunity levels. A proposition to consider here is the activation of TB disease in otherwise latent cases who would not have otherwise added to India's TB cases. There have also been numerous instances of the non-receipt of direct benefit transfers (DBT) under the *Nikshay Poshan Yojana,* a nutritional support scheme which gives a monthly sum of Rs. 500 to TB affected individuals to meet their nutrition and food requirements [50]. Poor nutrition forces those from economically weaker sections of society back into poverty and debt and puts them at risk of increased mortality due to TB [51]. A loss in income will also in all likelihood impact healthy behaviors like early care-seeking and diagnosis and will, thereby, increase the transmission of infection.

Treatment

The COVID-19 pandemic and lockdowns along with their impact on the health system and economy have also had a significant impact on TB treatment. At a macro-level, health system resources have been re-organized and re-directed towards COVID-19 care leading to shortfalls in TB care. Increasingly, there have been reports of non-availability of drugs in both the public and private sectors [52]. Also, access to new drugs such as Bedaquiline and Delamind is bound to reduce during this time leading to increased challenges for the treatment of multidrug resistant (MDR) TB [53]. Also, without supportive supervision and other forms of monitoring and support, treatment will be affected. The worst affected are drug-resistant TB patients who are on regimens of injections. Injections have to be administered by health

workers who are either unavailable or not easy to reach because of limited transport facilities [54]. The lack of access to health services has also brought up issues related to the management of adverse drug reactions and comorbidities.

Workforce Challenges

A large section of the TB workforce has been re-directed toward COVID-19 care. This has caused significant delays in active case finding at the community level, and so decrease in diagnosis, notifications, and treatment. There have been numerous reports from the ground indicating that patients on treatment are finding it challenging to contact their healthcare providers, reach hospitals, and health workers to get treatment, support for adherence, side-effect management, and a host of other issues [55]. As many health workers in remote areas, such as accredited social health activist (ASHA) workers, are re-directed to COVID-19 work, patients that require medicines and follow-ups for TB have no recourse.

Mental Health

India has not been addressing mental health problems that are common in TB patients [56]. People with mental health problems are at an increased risk of exposure to TB infection due to homelessness, smoking, poor nutrition, and comorbidities such as HIV [57]. Also, several anti-TB medicines like Cycloserine for drug-resistant TB cause mental health problems such as anxiety and psychosis. COVID-19 is exacerbating these problems [58]. Depressed patients are three times more likely to stop or give up on treatment due to side-effects than others. They are also more likely to delay seeking treatment. The result is drug resistance, increased transmission, and poor treatment outcomes.

Stigma

COVID-19 and TB symptoms are very similar. Both diseases are highly stigmatized. In TB, this stigma has been long-standing [59]. Stigma in TB manifests in two ways: (1) self-stigma which is a discrediting attribute that an individual acquires when going through a traumatic life-experience: This reduces the individual's status and capacity in his own eyes and (2) social stigma which is more obvious and direct: TB patients face isolation, discrimination, and rejection within families and communities. Stigma also causes anxiety and fear of perceived or actual job loss, divorce or abandonment,

and mistreatment within the family. Cultural ideas about TB associate it with socially unacceptable lifestyles and behaviors with particular reference to sexual behaviors, 'dirtiness and promiscuity,' alcohol, smoking, and 'sins' [60].

Gender disparities in TB are striking. While TB affects twice as many men as women, the brunt of social stigma disproportionately impacts women. There exist rampant incorrect notions about TB-related to fertility in women which leads to an increased and a severe form of stigma for women ranging from neglect to complete isolation. Examples of divorce, inability to marry a potential suitor, and challenges with in-laws are well documented. Since the health system is not responsive, many patients discontinued treatment.

Lack of Effective Communications

Throughout this crisis, a critical challenge has been the lack of reliable and effective public information and communication that engages credibly with the people and gives them helpful information. This is particularly true for TB-affected individuals and communities who have not been able to obtain reliable and accessible information on where to seek diagnosis and treatment, how to manage side-affects, and access government services or how to protect themselves from COVID-19. Instead, there has been confusion on the facts and most importantly on government support. This has affected patient morale and has also seen a fall in a number of patients seeking diagnosis and treatment, adherence monitoring, self-reporting, and managing of side-affects. One only needs to see the thousands of images of helplessness, hunger, and anger everywhere to realize this is not limited to TB patients alone.

Lack of Integrating Gender and Sexuality in Care

Experiences globally and in India show that women are more hesitant to report their symptoms, have poorer access to health care, shoulder a heavier burden of running the household, and are at higher risk of malnutrition than men [61]. Moreover, trans individuals, non-binaries, and persons with non-heteronormative sexual orientation are less likely to report their condition as they face discrimination and abuse by healthcare authorities and are often given poor quality care or denied access to it altogether. These conditions are exacerbated for those seeking care for TB and living with HIV [62]. Members of the lesbian, gay, bisexual, transgender, queer, and intersex (LGBTQI) communities report a higher incidence of HIV and other risk factors. As India and other countries struggle with COVID-19, the gendered aspect of the disease has been almost entirely ignored. The experience with TB in times of COVID-19 is unlikely to be different.

Addressing TB and COVID-19 Together

Addressing TB is determined by social, economic, cultural, religious, caste, and political factors. In this pandemic, charting a new course needs an understanding by decision-makers of these factors in the context of both diseases. The factors for TB have a strong bearing on COVID-19 infections as well. Hence, the two must work in tandem to navigate these complexities and competing priorities.

TB and COVID-19 are both airborne. Such airborne spread of TB and COVID-19 infection to others is most likely to occur with close contacts such as family members, friends, or those in school or at work. Overall, half of the untreated TB patients die of the disease, while others enter periods of re-mission and re-lapse that may last for decades. Current approaches to the pandemic do not even factor in the fact that India's extensive TB burden combined with COVID-19 is a dangerous mix that can devastate large sections of the population.

Furthermore, as has been reported, that many more TB cases and now COVID-19 survivors have, in some cases, reduced breathing capacity due to scar tissue in their lungs and so have compromised lung capacity [63, 64]. Hence, issues arising post-cure also need to be considered. Some suggestions on how to address TB and COVID-19 jointly are provided here.

Prioritize Case Detection

Fever and cough are symptoms of both TB and COVID-19. This commonality can be leveraged to encourage simultaneous screening and provision of diagnostic services for TB and COVID-19 in both the public and private health sectors. The government has announced bidirectional screening for TB and COVID-19. However, its implementation remains unclear and efforts made in this regard are undocumented [65]. It is important that TB programs must expand their capacity and continue using the Xpert MTB/rifampin (RIF) TB test since this test is critical for early detection of drug-resistant TB. There is an urgent need for case finding for TB and COVID-19. This is important in high density as also high burden areas. Case finding is the first step which is followed by isolation and treatment of cases.

Address Treatment Challenges

India needs to address treatment challenges for ongoing and new patients both in the public and private sectors. All TB patients should be provided with at least 2 to 3 months' supply of medications to minimize frequency of consultations at TB

facilities. The TB program must carefully track and forecast supplies to avoid stock-outs [66]. India's pharma industry has been gravely affected by the lockdown limiting the supply of essential medicines. India could explore setting up alternative medicine delivery networks such as courier services. It is critical for TB programs to switch to oral regimens recommended by the WHO. Access to new and novel adherence technologies and new drugs for TB must be increased in both the public and the private sectors.

Deploy Overarching Communication Plans

Even today, the most common fears among TB-affected individuals are around how they can self-protect, locate testing facilities, and obtain economic support. These insecurity and fear have been fed by an absence of communications from the state. There is an urgent need to prepare an overarching communication plan that helps with the delivery of the above-mentioned interventions. It should be planned and executed in a phase-wise manner. For starters, a comprehensive people-centered, focused information campaign that covers every aspect of these diseases from prevention, to where and how to access government support, testing, economic and food support, and health care in context of both TB and COVID, should be rolled out. There is a need to set up a communication strategy group in every district so that every query can be answered. False news should be stopped. It is important to engage with the media actively to provide information and answer queries about services available. In the absence of this, the authorities may end up feeding fear, stigma, and poor health-seeking behavior that will increase vulnerability. The need is to empower communities with information to help resolve their basic health, social, and economic concerns.

Initiate and Create Accessible Remote Treatment Support

With the fear of infection in clinical environments, on-site referrals for routine care should be replaced by remote support. This is particularly relevant for TB and COVID-19 patients in their quarantine site at home or in dedicated quarantine locations. This has created a dramatic impetus to find innovative ways to support patients remotely and effectively.

Create and Emphasize Community-Based Care

Capacity for community-based care is essential [65]. As community-based groups, including TB survivors, are generally closer to patients than TB program staff, they

could be engaged to provide peer support via WhatsApp, social media, and mobile phones during the COVID-19 pandemic. This can be supplemented by technology based support by health workers in difficult terrains where access remains difficult and infrastructure is weak.

Engage Private Health Services

The private health sector in India includes a range of service providers such as quacks especially in rural areas and qualified allopathic doctors who are mostly found in urban areas. This private sector is the largest provider of curative care in India. According to the National Family Health Survey-4, over 60% of all Indians seek care from the private sector at some point or another. In the case of TB, this number remains reasonably high even though the government provides free treatment and diagnosis. There are numerous reasons for this of which ease of access and perceived quality of care are the leading ones. Clearly, TB in India cannot be ended unless the private sector is effectively engaged. This means that the government needs to employ new and innovative strategies to engage and work with the private sector, mobilizing both the public and private health sectors, as well as community-based groups in a collective COVID-19 and TB response.

Strengthen Coverage and Timeliness of Direct Benefit Transfers to Patients and Providers

Direct benefit transfer (DBT) plays a crucial role in mitigating challenges pertaining to nutrition and travel support for patients and incentivizing private providers to notify and facilitate treatment completion [65]. Again, this is another instance where the program could benefit immediately through payments on a regular basis for *Nikshay Poshan Yojana* (NPY). Tribal and private provider schemes turnaround time (TAT) for NPY should be deployed soon. There is also a need to aggressively pursue procurement of digital signature certificates (DSCs), train staff via e-training and fast-track delivery of tokens in lockdowns to deploy DSCs.

Make Response Gender-Sensitive

Even today, there are numerous reports of gender discrimination because of hesitancy to seek care and widespread stigma in TB. It is, therefore, important to provide gender-sensitive care. An important first step is to initiate an inclusive public conversation about what TB, COVID-19, and other disease mean to genders and communities.

One of the ways the government can develop a narrative around gender and health is through public awareness campaigns. Next, it must integrate these concepts into training programs. The government must provide gender-sensitivity training to all health personnel. This is crucial because unless the conceptual frameworks change in the minds of those who provide care, it is meaningless.

Concluding Comments

As the world and India are grappling with the COVID-19 crisis, TB must not be forgotten. TB kills more than 1200 Indians every day. It is so widespread that it does not just destroy lives, it also pushes millions into poverty and debt. This happens even when its more dangerous forms such as drug resistant (DR-TB) remain curable. We need to ensure that we have strategies that work for both TB and COVID-19. This crisis presents an opportunity to improve access to health services and develop innovative tools, strategies, and community-based interventions that have been ignored for too long. Access to healthcare is critical for COVID-19 and also for TB as it ensures early diagnosis and treatment.

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Chapter 6
Ensuring the Continuity of Sexual and Reproductive Health and Family Planning Services During the COVID-19 Pandemic: Experiences and Lessons from the Women's Integrated Sexual Health Program

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Priti Dave, Omar Ahmed Omar, and Sebastiana A. Etzo

Abstract One of the main aims of the UK aid funded Women's Integrated Sexual Health (WISH2ACTION W2A) program is to strengthen government stewardship of sexual and reproductive health/family planning (SRH/FP) services across seven countries in South Asia and Sub-Saharan Africa. Options consultancy provides technical assistance within four work streams: 1) creation of a favorable policy and planning environment; 2) improved public sector investment; 3) national stewardship over quality improvement; and 4) establishment of accountability systems to influence and track commitments and policies. This role became even more important since the coronavirus disease (COVID-19) outbreak shifted government's priorities to the COVID response and led to the disruption in the delivery of essential health services, threatening to undo and reverse the SRH/FP gains made to date. In this chapter, the author shares Options' approach and experiences in engaging governments during the pandemic to ensure that access to SRH/FP remains a priority, alongside efforts to keep the routine enabling environment work on track. The author draws out wider lessons on the range of actions that can be taken at policy and systems level to protect SRH/FP during a health emergency in different country contexts, including the severity of the outbreak, socio-political environment, and health systems preparedness. The author also highlights how the pandemic can provide new policy opportunities, such as to accelerate self-care, and strengthen health systems resilience.

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Introduction

One of the main aims of the UK-aid funded Women's Integrated Sexual Health (WISH2ACTION) program is to strengthen government stewardship of sexual and reproductive health/family planning (SRH/FP) services across seven countries in South Asia and Sub-Saharan Africa. Options Consultancy provides technical assistance within four work streams or pathways of change: (1) creating a favorable policy and planning environment; (2) improving public sector investment; (3) strengthening national stewardship of quality improvement for SRH/FP services; and (4) establishing accountability systems to influence and track commitments and policies. Options' role became even more important since the COVID-19 outbreak shifted government's priorities to managing the pandemic response, which subsequently led to the disruption in the delivery of essential health services and threatens to reverse the SRH/FP gains that countries have made to date. In this chapter, we share Options' approach and experiences in working with governments during the pandemic to ensure access to SRH/FP remains a priority and our efforts to keep the pre-COVID-19 enabling environment work on track. The chapter draws out wider lessons on the range of actions that can be taken at policy and systems level to protect SRH/FP during a health emergency in different country contexts, including the severity of the outbreak, sociopolitical environment, and health systems preparedness. It also highlights how the pandemic can provide new policy opportunities, such as to accelerate self-care, and strengthen health systems resilience.

The methods used for the study included document review, semi-structured interviews with the Options country teams and the technical support staff located in Kenya and London, and semi-structured questionnaires sent to the country team leads. The interviews focused on understanding the main COVID-19 interventions implemented within the four work streams and their impact. The questionnaires elicited information on the severity of the COVID-19 outbreak in each country and data on SRH/FP service uptake during the period March to November 2020. Additionally, several case studies were conducted for a more in-depth understanding of the COVID-19 adaptations and results achieved.

Following this introduction, the aims and objectives of the WISH2ACTION program are described, focusing on the creation of an enabling environment for the SRH/FP component. Next, information on the severity of the COVID-19 outbreak across the seven countries and governments' response in the early phase of the outbreak is presented. Then, the multipronged approach adopted by Options within the four enabling environment work streams to ensure SRH/FP remained a priority of government, and the results achieved are discussed. The extent to which the pre-COVID-19 work was able to progress during the first 8 months of the pandemic is also examined. The impact the pandemic had on SRH/FP service uptake and the contribution of the WISH2ACTION program in minimizing the disruption to service access is assessed. The chapter ends by drawing out key lessons on what worked in what context, what could have been done better, and if the pandemic presented new opportunities for progressing the enabling environment work.

Background

Women's Integrated Sexual Health Program

The Women's Integrated Sexual Health Program (WISH2ACTION) is a UK-aid funded program which aims to support countries to achieve their national SRH/FP goals and realize their FP2020 commitments.[1] The program supports women and their partners to safely plan their pregnancies and improve their sexual and reproductive health, particularly the young, the poorest, and people with disability through:

1. Rights-based provision of private sector sexual and reproductive health information and services, and strengthening of public sector health information and services.
2. Addressing barriers to family planning uptake at individual, interpersonal, community, and institutional level.
3. Improving policies, government financing, stewardship for quality improvement, and accountability to create an enabling environment for family planning and sexual and reproductive health and rights.

WISH2ACTION is implemented through a consortium of organizations led by the International Planned Parenthood Federation (IPPF) with MSI Reproductive Choices, International Rescue Committee (IRC), Development Media International (DMI), Humanity and Inclusion, and Options Consultancy Services Limited. The consortium works in a coordinated manner to deliver synergistic impact, prevent unintended pregnancies, and reduce maternal mortality. All partners are using the pathway of change (PoC) tool to drive sustainable impact within their respective work components [1]. 'The PoC responds to the need for a more practical adaptive programming tool that can be tailored to support flexibility in global health program implementation.' The tool facilitates adaptive, contextualized planning and monitoring for multi-country programs.

Options leads on component 3 and is tasked with creating an enabling environment for SRH/FP in seven countries—Bangladesh, Pakistan, Uganda, Zambia, Tanzania, Madagascar, and Malawi. The work comprises four interconnected streams of work or pathways of change (Fig. 6.1).

1. **Facilitating a favorable SRH/FP policy and planning environment**: Having the right policies and legislation in place and rolled out to address critical SRH/FP gaps is a cornerstone of WISH2ACTION's approach to strengthening national ownership. Key activities in this pathway of change include: conducting a political economy analysis to identify key policy gaps and opportunities;

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[1] FP2020 is an outcome of the 2012 London Summit on Family Planning where more than 20 governments made commitments to address the policy, financing, delivery, and sociocultural barriers to women accessing contraceptive information, services, and supplies and donors pledged an additional US$2.6 billion in funding.

Fig. 6.1 Enabling environment goals and pathways of change. *Source* Options Consultancy Services

    reviewing status of country SRH/FP plans; updating and supporting the development of new SRH/FP policies; ensuring policies are incorporated into costed annual health plans/FP2020 costed implementation plan; development of policy advocacy tools; and tracking the implementation of policies and plans at national and sub-national levels.

2. **Improving public sector investment**: Increased allocation and spend of national budget for SRH/FP commodities and services is a core indicator of strong national ownership leading to sustained SRH/FP outcomes. Options works at country level to make the case for increased domestic investments and more timely release and utilization of SRH/FP budgets. Key activities in this pathway of change include: mapping fund flows and family planning expenditure tracking; cost analyses of services and/or commodities; strengthening capacity of governments in budgeting, planning, and financial management; strengthening capacity of civil society on budget analysis and tracking; advocating for a dedicated SRH/FP budget line; and advocating for increased investments in family planning commodities.

3. **Strengthening national stewardship over SRH/FP quality improvement**: WISH2ACTION supports the creation of a sustained quality improvement (QI) process that is nationally driven, coordinated, and embedded within the institutional fabric of the health system. Key activities in this pathway of change include: conducting a situation analysis on the status of stewardship of SRH/FP quality improvement; development of national standards, policies, and guidelines for quality services; developing a QI scorecard or dashboard to track

quality indicators; and strengthening capacity of government to used QI data for planning purposes.

4. **Strengthening accountability systems to influence and track key SRH/FP commitments and policies**: While governments have made commitments to improve SRH/FP, in many cases, these have not translated into increased budget allocations or improved policies. To improve government accountability, WISH2ACTION works through national and sub-national accountability mechanisms to monitor progress of plans and budgets, identify gaps, and put pressure on governments where action is needed. Key activities in this pathway of change include: helping from a representative accountability platform; developing capacity of accountability mechanisms on using evidence for advocacy and accountability; supporting collection of data to track progress; and sharing evidence with media and target audiences who are in a position to act (such as parliamentarians and ministry of health (MoH) officials at national, regional, and district levels).

The PoC tool has facilitated joined-up working across the four work streams (especially evidence and accountability working closely with policy and planning and health financing), leading to greater synergy and impact.

Options had been implementing the WISH2ACTION program in these seven countries for fifteen months, and country teams had built a strong relationship with governments and other SRH/FP stakeholders when COVID-19 struck. As a result, they were able to quickly pivot their support to minimizing the impact of COVID-19 on SRH/FP services.

COVID-19 Outbreak

All seven countries had confirmed COVID-19 cases by April 2020. The outbreak was larger in South Asia compared to Sub-Saharan Africa, with Pakistan the most heavily impacted. Pakistan registered a total of 908 cases per 100,000 population during March to November. During the same time period in Africa, Madagascar had the largest number of cases at 293/1000,000, compared to Zambia (101/100,000) and Malawi (156/100,000). Figures 6.2a, b displays the number of monthly COVID-19 cases in 6 countries by region. It displays three patterns: (1) a steady rise in cases followed by steady drop (Zambia and Bangladesh); (2) a steady rise followed by a plateauing of cases (Madagascar and Malawi); and (3) a steady rise throughout the period (Uganda and Pakistan). It is caveated that this analysis is heavily dependent on the testing capacity of countries. The number of deaths in each month followed the same trajectory as number of cases, with fatality rates ranging from 0.91% in Uganda to 2.91% in Malawi. To date, Tanzania has reported a total of 509 cases of COVID-19 and 21 deaths during March and April. The President declared the country COVID free in June, stopped reporting cases to the WHO, and has denied the presence of the pandemic since then.

a

b
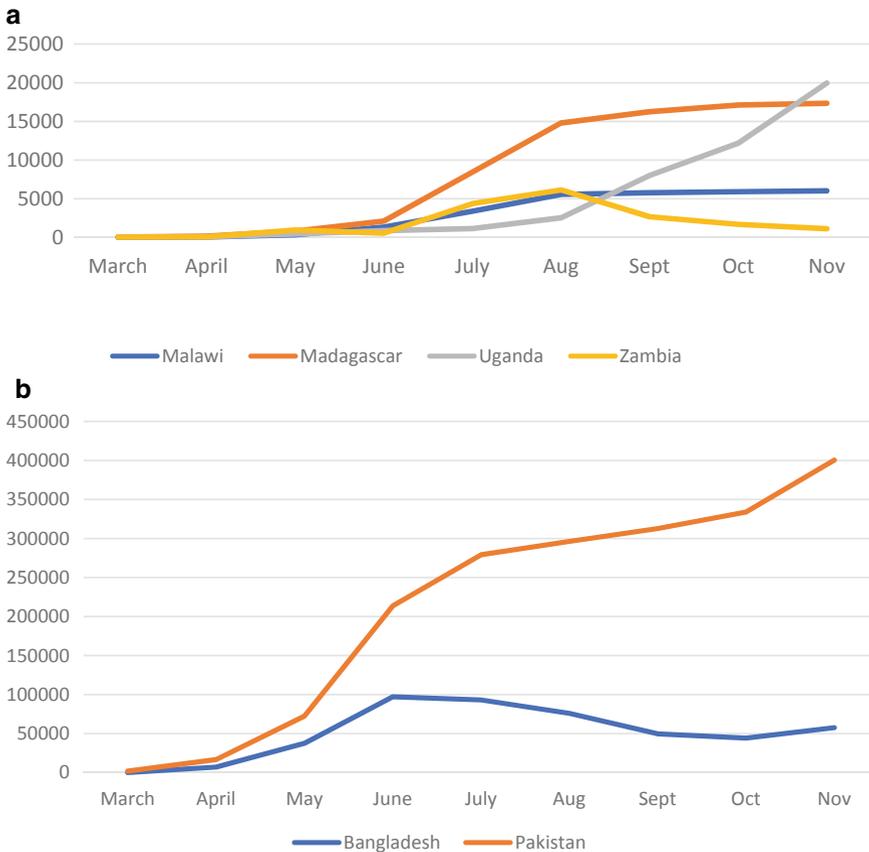
Fig. 6.2 **a** Number of COVID-19 cases in Sub-Saharan Africa in 2020. *Source* Official COVID-19 data reported by the respective governments. **b** Number of COVID-19 cases in South Asia in 2020. *Source* Official COVID-19 data reported by the respective governments

Governments across the seven countries were quick to introduce lockdown measures and to turn their attention to COVID-19 prevention, management, care, and treatment. However, it took time to roll out personal protection equipment (PPE) to facilities and to implement track and test systems. While health facilities remained open in all the WISH2ACTION countries except Pakistan, SRH/FP provision was severely curtailed in the first few months of the pandemic as both health workers and clients were not able to reach facilities, due to the enforced curfews and lack of public transportation and fear of contracting the virus in health facilities. In Malawi, for example, health workers went on strike due to the lack of PPE [2]. All this led to a drop in uptake of SRH/FP services in public facilities in all countries, during the first few months of the pandemic.

Within weeks of the pandemic striking, the Options country teams used the PoC tool to adapt their work plans toward helping governments mitigate the disruption

to SRH/FP services, and ensure that progress toward sustainability goals was maintained. This included efforts to deliver their original planned work to the extent possible.

Ensuring Continuity of Government's Sexual and Reproductive Health/Family Planning Services

The Ebola epidemic and other similar infectious disease outbreaks have illustrated the detrimental impact such health emergencies can have on the provision of essential services if the health system is not adequately prepared. This includes health worker attention being diverted to managing the new crisis, disruption in procurement and supply chains for commodities, including contraceptives, and clients not visiting health facilities due to fear of contracting the virus. It is estimated that even a 10% decline in contraceptive use in low- and middle-income countries will result in an additional 49 million women with an unmet need, an additional 15 million unintended pregnancies, plus additional 3 million unsafe abortions would result in additional 1000 maternal deaths [3].

Recognizing this very real risk to WISH2ACTION countries, the Options country teams reached out to government counterparts as soon as the pandemic arrived, to offer support and press on the importance of maintaining SRH/FP services. In almost all cases, this was done virtually due to lockdown, using existing platforms such as SRH/FP technical working groups (TWGs) and, in some cases, newly established COVID-19 platforms. An advantage of this approach was that it enabled coordination of technical assistance (TA) with other TA providers (such as United Nations Population Fund (UNFPA) and Health Policy Plus (HP+), among others) and harmonization of messages. In the early stage of the outbreak, the main request to donors was for assistance to secure adequate PPE, put in place a test, track, and trace system, and extend treatment and care to those who tested positive. Technical partners in these forums pressed on the importance of having guidelines, protocols, and capacity in place to undertake these functions effectively, especially those related to infection control, so that essential services, including SRH/FP, could be safely provided. The WISH consortium continued to meet regularly throughout the pandemic to ensure synergy across their COVID-19 adaptations.

The next section outlines the activities undertaken within the four enabling environment pathways of change over the first six months of the pandemic, to ensure SRH/FP were considered essential services and that they continue to be accessible.

Policy and Planning Pathway

The sustainability goal of the policy and planning pathway was modified at the start of the pandemic to 'supportive SRH/FP policies, legislation, or commitments in place and/or being implemented despite *public health emergencies.*' The Options teams shifted their attention toward mitigating the disruption of COVID-19 on SRH/FP services and at the same time attempting to progress their ongoing pre-COVID work to foster an enabling policy and planning environment for SRH/FP. They engaged government through different virtual platforms to identify and agree, in coordination with other technical assistance (TA) providers, what they could do to ensure continuity of SRH/FP services. For example, the Malawi team, on realizing the COVID-19 National Response Committee did not have SRH/FP representation (and hence did not consider these essential services during the pandemic), pushed for, and was successful in establishing a sub-cluster committee on SRH/FP. This platform was effectively used to raise problems being experienced with service delivery, particularly related to family planning commodity stock out and challenges in accessing emergency contraception (EC).

Zambia, Madagascar, Uganda, and Pakistan teams produced policy briefs to advocate to governments to declare SRH/FP services essential during the pandemic and advised them on how they could practically modify service delivery approaches to ensure uninterrupted service provision. Drawing on the experience of the 2013–2016 Ebola crisis in Sierra Leone, where the number of maternal, neonatal, and stillbirth deaths related to disruption in family planning and maternal health services was equivalent to direct deaths from the virus, the briefs presented country-specific estimations of the excess unintended pregnancies, unsafe abortions, and ultimately excess maternal and newborn deaths that would result from COVID-19-related SRH/FP service disruption [4]. All the briefs called out the greater challenges faced by adolescent girls in accessing contraception during an emergency and their greater need and vulnerability due to school closures [5].

The policy briefs outlined context-specific strategies to ensure continuation of SRH/FP services during the health emergency and post-recovery period. This included:

- Ensuring provider safety and facility readiness to provide SRH/FP services through introduction of robust infection prevention and control (IPC) measures.
- Placing greater emphasis on community-based care through community health workers.
- Ensuring commodity security, through stronger forecasting and better monitoring of consumption at facility level, multi-month dispensing, and making greater use of private delivery systems.
- Greater emphasis on self-care (e.g., though self-administration of depot medroxyprogesterone acetate subcutaneous (DMPA-SC) or emergency contraception) that requires fewer or no visits to a health facility.
- Reaching out to adolescents through social media and other virtual platforms.

Some policy briefs (Uganda, Zambia, and Pakistan) outlined the need to support victims of gender-based violence, a silent pandemic within a pandemic during lockdown periods.

Options disseminated the policy briefs to decision-makers through a variety of channels, including in hard copy, and virtually to SRH/FP TWGs, National Health Taskforces, and Parliamentary Health Committee, among others. Additionally, in several countries, the advocacy messages were packaged by the civil society account-ability mechanism and taken up by the media. It is hard to measure and directly attribute the impact the policy briefs had on government decisions and ultimately on the continuity of SRH/FP services. However, governments did introduce COVID-19 guidelines in Zambia, infection control guidelines and training in Pakistan, and DMPA-SC self-care in Madagascar so we can conclude the policy briefs, together with advocacy efforts from other technical partners, contributed to these decisions.

Other activities undertaken in this work stream to promote continuity of care were:

- **Development of frequently asked questions and guidelines**: Tanzania compiled a comprehensive set of frequently asked questions (FAQs) on COVID-19 and its implications for SRH/FP for inclusion in the government's COVID-19 guidelines. However, this did not materialize, due to the President declaring the country free of COVID-19 in June. Bangladesh joined a technical committee setup to incorporate COVID-19 management into the existing SRH/FP guidelines. The guidelines were used to train service providers in infection prevention and control. Similar work, on development of guidelines and protocols, was undertaken in the quality improvement pathway.
- **Promotion of self-care**: Options country teams recognized the potential for self-care (i.e., SRH/FP products such as the injectable contraceptive DMPA-SC and emergency contraception that can be self-administered) as a way of circumventing the service delivery challenges being faced during the COVID-19 crisis. COVID-19 Policy Briefs prepared by Madagascar, Zambia, Uganda, and Pakistan all advocated for rollout of self-care, especially DMPA-SC. Governments of Zambia and Uganda had already approved self-administration of DMPA-SC prior to the arrival of the COVID-19 pandemic. Therefore, in Uganda, Options advocated for orientating district health workers on the DMPA-SC self-injection guidelines and for community health workers to be trained to support self-administration. In Zambia, they advocated for DMPA-SC distribution through community health workers and retail pharmacies for wider reach, and to use social media to inform women and girls on the availability of this method of contraception. The Mada-gascar team's work to promote DMPA-SC self-injection during the pandemic is outlined in Box 1.

Box 1. Promoting Self-care in Madagascar

In Madagascar, Options and other partners had already laid much of the groundwork for introduction of self-injection, including development of operational guidelines and regional-level training, prior to the start of the pandemic. However, the program had still not been officially launched and rolled out. Recognizing that COVID-19 presented an opportunity to accelerate the national operationalization of self-injection, Options briefed the Madagascan Ministry of Health and the Director of Family Health on the advantages of promoting DMPA-SC self-injection as a part of the health emergency response. This led to the official launch of the DMPA-SC program the following week (May 28, 2020) through a webinar with all 22 regional health directors present and the rollout of the operational guidelines to service providers.

The policy change enabled women and girls to receive training on self-administration by health workers, get their first injection at a facility, and take home two further doses for self-administration. This means they will not have to return to the facility before 9 months. Since the launch in May, there has been a steady increase in the uptake of DMPA-SC. The introduction of the self-injectable during the pandemic led to a significant rise in DMPA-SC uptake from 3205 new users in May to 7536 new users in January 2021.

On the whole, countries found it challenging to progress their pre-COVID policy and planning work agendas, because health leadership was fully absorbed with the COVID-19 management response. However, Malawi still managed to make significant progress with their work aimed at updating the termination of pregnancy (ToP) legislation, as this entailed working largely with parliamentarians. In fact, the rise in teen pregnancies experienced during the pandemic helped increase support for the revised ToP legislation. The Tanzanian team was also able to continue their pre-COVID-19 work, supporting reviews of regional reproductive, maternal, neonatal, child, and adolescent health (RMNCHA) strategies. This was only possible because of the unique political context in Tanzania, with the President denying the presence of COVID-19 in the country.

Key Learnings from the Pathway

- Significant contributions were made in mitigating disruptions to SRH/FP services, especially through incorporating health emergency response within existing SRH guidelines and rollout of self-care.
- COVID-19 provided a policy window to accelerate the rollout of self-care, namely DMPA-SC self-injection in Madagascar, and progress the ToP legislation in Malawi.

- Most countries found it difficult to progress the pre-COVID-19 policy and planning work, especially related to development of new policies or work at the district level to strengthen implementation of local SRH/FP plans. However, several countries were able to continue to work with parliamentarians throughout the pandemic.

Health Financing Pathway

The sustainability goal of the health financing pathway was modified at the start of the pandemic from 'securing improvement in public sector investment in SRH/FP' to '*improvement or protection of SRH/FP investments during the COVID-19 crisis.*' Country teams focused on preventing governments re-prioritizing resources during the health emergency that would have a detrimental impact on SRH/FP service provision. At the same time, they continued to pursue their ongoing work to strengthen public investment and spend in SRH/FP through virtual platforms, stressing that this was even more important in the context of the pandemic.

Bangladesh, Madagascar, and Malawi brought out investment cases to advocate to governments on the importance of continuing to fund the SRH/FP programs during the COVID-19 crisis and recovery period.

The evidence-based investment policy briefs reinforced the message that a reduction in SRH/FP funding during the crisis would lead to disruption in service provision and result in additional maternal, newborn, and child deaths. For example, Malawi estimated a disruption in services caused by a policy of moderate lockdown will contribute to additional 9550 maternal and child deaths over the next five years. The policy briefs also emphasized that investing in critical SRH/FP services and commodities at this time will save money through decreased pressure on the health system and will also help the country to get back on track to achieve its development goals. The Bangladesh investment case stressed that the government must give greater emphasis to SRH/FP services within the health budget for the country to continue to reap economic gains through the demographic dividend.

The investment briefs were disseminated to parliamentarians, ministries of finance, health directorates, regional and district councils, and civil society with some recorded success. For example, working with parliamentarians and other key stakeholders, Options in Malawi succeeded in securing commitment to increase the family planning commodity budget from MK176m to MK200 (see Box 2). In Madagascar, the WISH accountability platform (COMARESS—a civil society organization coalition) was supported to disseminate the policy brief to regional councils. Amoron'i Mania Region responded by incorporating family planning into their annual budgeted work plan. COMARESS also worked with parliamentarians and was successful in securing a commitment for the 2021 family planning commodity budget to increase by 50%. The Finance Bill was presented in November 2020. However, the executive

arm removed the family planning budget even though it had been passed by parliament. After intense advocacy by COMARESS, the higher family planning budget was reinstated.

Zambia and Bangladesh were also successful in progressing their health financing work during the COVID-19 outbreak by working virtually with key stakeholders. In Zambia, Options had identified low disbursement of funds against SRH/FP budget allocations as the main financing challenge. Building on their budget monitoring and tracking work, the team made the case to the Parliamentary Committee for Health that timely release and utilization of SRH/FP funds were even more important during the COVID-19 crisis to prevent family planning commodity stock outs at health facilities. This led to parliamentarians querying the underspend with the Ministry of Finance, which in turn followed up with the Ministry of Health. The collective advocacy resulted in increased disbursements being made to districts. Upto quarter 3 of FY2020, 67% of the SRH/FP budget had been spent compared to only 41% during the same period in the previous year.

The Bangladesh team was able to continue their work on digitizing the SRH/FP financial management system (FMS). The digital FMS will support better tracking of allocations, disbursements, and spend on SRH/FP activities, and ultimately lead to more effective and transparent budget utilization. The Options team took the opportunity to add a financial indicator in the FMS specifically for infection control during a health crisis. This will support tracking of allocations to PPE in this crisis as well as future infectious disease outbreaks, thus contributing to stronger health systems resilience.

In most of the countries, the COVID-19 outbreak slowed progress on strengthening SRH/FP financing. However, in Malawi and Zambia, and to some extent in Madagascar, the COVID-19 emergency strengthened the case for increased funding to SRH/FP and timely fund disbursements and utilization. Several factors appear to have influenced the scope for action and progress, including the strength of the relationships that had been built with government prior to COVID-19, and the ability to interact with policy-makers virtually. However, the main driver of the ability to act and influence public financing is a country's political economy, and this holds both within and outside of a health emergency.

Box 2. Using the Investment Case as an Advocacy Tool in Malawi

On learning that the family planning commodity budget line for FY 2020/21 had been reduced from MK186m in FY 2019/20 to MK176 million in FY 2020/21, Options in collaboration with MANASO, the WISH accountability partner, organized a meeting with the Ministry of Health to strategize how the family planning commodity budget could not only be reinstated but be increased. It was agreed that Options would convene a Health Financing Advocacy Coalition of key SRH/FP stakeholders and make a presentation to Members of Parliament during the National Assembly Budget Hearing (in October 2020), laying out

the case to increase the family planning commodity budget. At this hearing, Options drew on the analysis presented in the investment brief and made the case that an increase in the family planning commodity budget was even more important in the context of the pandemic to ensure uninterrupted provision of family planning services.

The Members of Parliament welcomed the presentation and recommendations that were put forward and agreed to push for an increase in the family planning commodity line allocation in the budget to MKW 250 million. During subsequent deliberations on the 2020/2021 budget, this was decreased to MK200m. Though a lower amount than advocated, it still represents a 14% increase over the original proposed allocation.

Key Learnings from the Pathway

- It is possible during a health crisis to strengthen public investment for SRH/FP and, at a minimum, maintain key relationships, continue generating evidence, and advocate for change.
- Experiences in Malawi and Zambia show that presenting evidence of the impact the pandemic is having on SRH/FP services to key decision-makers can strengthen the case for more and better public investment in SRH/FP.
- Building resilience into ongoing systems and strengthening work is feasible, as demonstrated in Bangladesh.

Quality Improvement Pathway

As in the other pathways, the quality improvement (QI) pathway was adjusted to respond to government needs during the COVID-19 pandemic, while also developing strategies to ensure a continued focus on the WISH2ACTION program goals. To inform this process, the Pakistan and Malawi teams used a tool designed by Options, to assess the level of disruption to QI stewardship work during the COVID-19 pandemic and guide needed adaptations. It can also help identify support needs of government to address QI for SRH/FP during the pandemic. The tool scores countries against several criteria, including disruption in government capacity to act as steward over SRH/FP, government prioritization of SRH/FP during COVID-19, and level of disruption and adaptation to SRH/FP services.

In Pakistan, following the assessment, Options offered to support the Population Welfare Department (PWD) in trickle-down trainings for infection prevention and control (IPC) guidelines and COVID-19-related information education and communication (IEC) aides for health workers and service users, in the four WISH districts

of Punjab. The PWD had closed all their facilities as soon as the pandemic arrived in the country due to lack of IPC measures and PPE, and as a result of the support provided by Options, they were able to reopen facilities in these districts by the end of July. In Malawi, the assessment showed a significant drop in number of clients accessing family planning, due in large part to health workers having gone on strike due to a shortage of IPC supplies. The technical partners (such as Options, UNFPA, and HP+, among others) responded in a coordinated manner to help maintain SRH/FP services during the pandemic. Options took responsibility for adding a chapter in the national family planning reference manual on 'Provision of family planning services during emergency situations.' Once the new chapter is approved by the government, the team will use the manual to roll out training. Both Malawi and Pakistan teams planned to repeat the QI assessment after a 3-month period, to track progress being made with mitigating SRH/FP service disruption, as well as mitigating disruptions to QI stewardship work and inform ongoing support needs. The second assessment in Pakistan showed that shortages of PPE and contraceptive commodities continued to be a challenge in PWD-run facilities. In response, Options agreed to train health providers in provision of the DMPA-SC injectable as a way of mitigating commodity shortages.

Although other WISH2ACTION countries did not conduct a systematic assessment to guide their response to helping government address QI for SRH/FP during the pandemic, they acted in a similar manner. Several helped incorporate IPC into existing SRH/FP guidelines. Tanzania and Uganda undertook assessments to determine how ready facilities were to provide essential services, including SRH/FP. Tanzania was not able to follow through on their findings due to the subsequent political denial of the COVID-19 pandemic.

Uganda shared its findings with the Parliamentary Portfolio Committee, highlighting that most health facilities were ill-prepared and not ready to sustain routine service delivery during the lockdown. Bangladesh, Madagascar, and Zambia were able to progress their pre-COVID-19 QI stewardship work by working virtually with senior officials:

- Madagascar was able to progress the development of a quality improvement (QI) guide and agree to rolling out an implementation plan for QI guidelines during the pandemic by moving all meetings online. It organized a Zoom meeting for the Sub-Committee for Quality Improvement of Family Planning in June 2020 and agreed to the timetable and approach for implementing the QI guide. Due to lockdown conditions, the plan includes conducting training using Zoom and making greater use of training videos, both examples of new adapted ways of working during the pandemic.
- Bangladesh continued working on the development of a digital family planning clinical supervision quality improvement monitoring tool. It seized the opportunity to incorporate new indicators related to COVID-19 infection prevention and control into this system, enabling better tracking of health staff and client safety in health facilities including hand-washing and social distancing.

- Zambia continued its discussions on which key indicators to include in the QI scorecard.[2] It populated the scorecard to capture the situation pre-COVID-19 and during the health emergency. Although Zambia did not adopt the scorecard for COVID-19 specifically, the assessments showed that the pandemic had an impact on quality of care.

Key Learnings from the Pathway

- By leveraging existing QI networks, the Options teams were able to respond and contribute to addressing the more direct QI needs for SRH/FP arising from the pandemic. This work helped ensure that continued progress was made toward WISH sustainability goals.
- By incorporating COVID-19 preparedness into existing SRH/FP guidelines and QI stewardship work, it was possible to contribute to development of more resilient health systems. This work will endure and ensure SRH/FP systems are more prepared for the next health emergency.
- The facility readiness and disruption to QI stewardship tools that have been developed by Options represent global public goods that can be used by other countries in the current health emergency and in the future emergencies. For example, the facility readiness tool has already been adapted for use in psychiatric hospitals in Ghana.

Evidence and Accountability Pathway

In Madagascar, Zambia, Uganda, Malawi, and Bangladesh, where Options was helping to strengthen civil society accountability mechanisms for SRH/FP, they were supported to pivot their attention toward holding government to account for the continuation of SRH/FP services during the pandemic. By working in a complimentary manner with the other pathways of change, especially policy and planning and health financing, the accountability work was able to deliver synergistic impact. Actions included: generating information on the impact COVID-19 was having on SRH/FP service delivery and uptake by women and girls, packaging the evidence into compelling formats, and using it to advocate to key decision-makers to continue providing SRH/FP information, counseling, and services. In Madagascar and Malawi, the accountability mechanism disseminated advocacy messages that had been generated by the policy and planning and health financing pathways, namely the policy briefs and investment case briefs.

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[2] The QI scorecard is a tool that has been developed by Options to track quality improvement on SRH/FP at national level (sub-national in devolved contexts) and national stewardship of SRH/FP quality improvement.

Advocacy messages were targeted at decision-makers in central government (e.g., in Malawi) as well as at sub-national level (e.g., in Madagascar), using a range of platforms, such as parliamentary committees, budget committees, SRH/FP technical working groups, district forums, and one-on-one meetings with key decision-makers. Several of the accountability structures (Uganda, Madagascar, and Zambia) worked with the print and digital media to draw attention to the impact COVID-19 was having on SRH/FP services, as a way to build pressure on government to act. The media was supported and encouraged to publish human interest stories highlighting the impact the neglect of SRH/FP services was having on vulnerable groups such as adolescents and people with disabilities.

The Options teams in Madagascar and Uganda were successful in advocating and bringing about change at regional levels. In Madagascar, they supported COMA-RESS, their civil society accountability partner, who has a presence in all 22 regions of the country, to develop regional advocacy strategies. In Vatovavy-Fitovinany Region, the COMARESS affiliate met with the regional RH/FP manager and requested access to data on family planning uptake prior to and after the COVID-19 outbreak. Noticing a sharp drop in family planning uptake, they then shared the analysis with the Regional Director of Health who agreed to sensitize health workers in the region on the importance of continuing to provide quality family planning services and ensure availability of family planning commodities. Following the meeting, the Regional Director of Health also took the initiative of using a local radio program that was broadcasting daily on the COVID-19 situation, to inform the population that they should continue to visit government health facilities for SRH/FP services and that it was safe to do so.

In Uganda, the lead civil society organizations under the sub-national accountability mechanism in Bugiri and Kaliro districts conducted a rapid assessment to gather evidence on the detrimental impact COVID-19 was having on SRH/FP service access. The organizations shared this information with the District Task Force on COVID-19 (rather than the District Family Planning Coordinator). This resulted in an easing of restrictions on the provision of community outreach family planning services.

Box 3 outlines the work undertaken by the evidence and accountability mechanisms in Zambia to hold the government accountable for SRH/FP service continuity during the COVID-19 crisis and describes some of the results achieved.

Box 3. Strategies for Holding Government to Account During COVID-19 in Zambia

In Zambia, Options and the accountability partner initially focused their efforts on securing health facility safety and a transparent and robust COVID-19 response. They developed a media brief advocating for transparent and prudent use of COVID-19 resources and for adequate supply and distribution of PPE. It highlighted that 30% of health workers would become infected with COVID-19 in the absence of prompt action. This effort, alongside efforts from other

technical partners, led to the Government of Zambia launching the National Strategy for Reducing New Infections of COVID-19, issuing standard operating procedures for community engagement, and publishing a list of all COVID-19 funding received and spent.

The accountability mechanism was then supported to undertake a review of how the pandemic was affecting SRH/FP services delivery and advocate for more specific actions to be taken to ensure the continuation of services. Finding a sharp drop in new family planning users in the period March to May 2020 compared to the same period in the previous year (see Fig. 6.3), a reduction in budget allocations, and commodity stock out in facilities, they re-engaged the media to support publication of stories on the impact the pandemic was having on SRH/FP service provision. They also encouraged the media to highlight what government needed to do to improve service access, for example, through promotion of self-care and prioritizing the needs of adolescent girls.

Options was not able to leverage a civil society-driven accountability mechanism in Pakistan and Tanzania for the continuation of SRH/FP services, as the political environment in the two countries was not conducive. In Pakistan, the security environment did not permit the concept of government being held accountable by civil society. As a result, the team advocated directly to the Population Welfare Board. In Tanzania, Options initiated a rapid political economy analysis (PEA) early on in the outbreak to understand how SRH/FP services were being prioritized within the COVID-19 context. The rapid PEA also aimed to understand the scope to influence through the accountability mechanism (the Global Financing Facility (GFF), Civil Society Coordinating Group). However, it was not possible to take this effort forward because of the denial of the presence of the pandemic in the country. Efforts then shifted back to progressing the pre-COVID-19 work agenda.

Key Learnings from the Pathway

- Civil society coalitions can be effective in holding governments to account for providing SRH/FP services during a health emergency if the political context is conducive. Additionally, the media, when briefed well, can be a key ally in holding governments accountable.
- It is important that accountability initiatives are directed at both national and sub-national levels for maximum impact.
- In countries like Zambia with a favorable political environment and a strong civil society culture, the capacity of the accountability mechanism to hold government to account in a future health emergency is likely to be sustained.

Program Contribution to Mitigating the Disruption of COVID-19 on Sexual and Reproductive Health and Family Planning Service Uptake

Due to the lack of preparedness for the health emergency, including securing infection control in health facilities quickly and not considering SRH/FP an essential component of the emergency response, all the countries except Tanzania experienced a decline in SRH/FP uptake (as indicated by the modern contraceptive prevalence rate (mCPR) of new family planning users, family planning discontinuation, and number of injectable users), when compared to family planning uptake in the previous year. Most countries experienced the biggest fall during March to May 2020, followed by a gradual improvement from June/July onward. As of November 2020, the majority had reached or almost reached pre-COVID-19 performance levels, with the exception of Pakistan. Tanzania is an outlier in that there is no discernable impact of COVID-19 on family planning uptake levels. Figures 6.3a, b outline the impact of COVID-19 by comparing family planning uptake in 2019 and 2020 in Pakistan and Zambia. In Pakistan, the mCPR completely collapsed in April 2020 (to 0.06% compared to 31.9% in April 2019), as the Population Welfare Department closed all facilities at the onset of the pandemic. mCPR gradually increased from July onward when facilities reopened. However, as of November, it has still to reach pre-COVID-19 levels (mCPR was 23.2% in November 2020 compared to 34.1% in the same month of the previous year). In Zambia, there were 19.2 new users in April 2020 compared to 25.9 in the same month in 2019. New users started to increase gradually thereafter and by November had reached pre-COVID-19 levels (22.8 new users in November 2020, compared to 22 in the same month the previous year). Data on family planning performance in 2019 and 2020 for each country can be found at the end of the chapter.

Although data is not yet available to show the direct impact of the actions taken by Options on family planning performance, we can conclude that our interventions, together with those by other technical partners, contributed to minimizing the disruption to SRH/FP services caused by the pandemic. For example, work undertaken in Pakistan's QI pathway on supporting IPC training, printing and sharing of communication materials through virtual platforms directly supported the reopening of facilities in July. Similarly, in Zambia, advocacy undertaken through the policy and planning, and accountability pathways led to stronger COVID-19 safety in health facilities, transparency in the government COVID-19 funding and response, and SRH/FP service adaptations (such as self-care) that helped regain some of the initial COVID-19-related SRH/FP service losses.

However, COVID-19 has impacted the pace of progress of the enabling environment work agenda. Early in the pandemic, it was difficult to engage senior health leadership at national and sub-national levels, as their attention had shifted to managing the COVID-19 response. Additionally, Options teams in all instances turned their attention to helping to minimize the disruption in SRH/FP services. Most countries were able to pick up on their routine work 2–3 months into the pandemic, when government had more bandwidth to engage with technical partners, still mostly doing

a

b
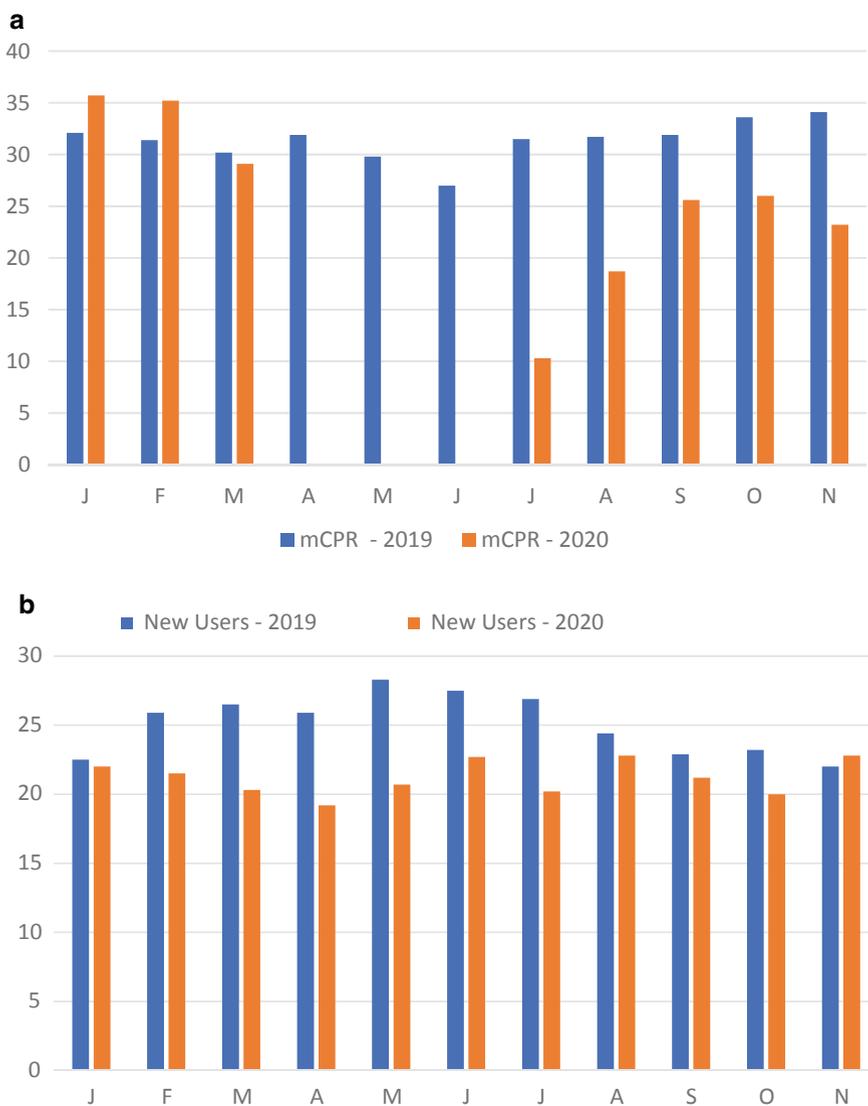
Fig. 6.3 a Pakistan: modern contraceptive prevalence rate (mCPR) in 2019 and 2021 (%). *Source* Contraceptive Logistics Management Information System (cLMIS). **b** Zambia: New family planning users in 2019 and 2020. *Source* DHIS2

this through virtual platforms. In some instances, like in Malawi, to make the case for an increased budget for commodities, COVID-19 actually served to strengthen the case for more funding, thereby facilitating the routine health financing work. More broadly, we can conclude that without the COVID-19 adaptations to the enabling environment work plan, the WISH2ACTION sustainability goals would have been impacted even more negatively than they were.

Key Conclusions and Lessons

This final section draws out wider lessons and conclusions on what worked in different contexts and what could have been done better to inform actions to minimize disruption in SRH/FP services in a future pandemic.

- **The enabling environment work provided a crucial platform to help mitigate the disruptive impact of COVID-19 on SRH/FP services**: The Options country teams were able to provide rapid TA that was aligned to the enabling environment work and make a substantial contribution to reducing the disruption to SRH/FP services. This points to the importance of the enabling environment work as a way to build resilient and more sustainable SRH/FP policies and systems both within and outside of a pandemic. Some notable achievements include:

  – Emergency-ready SRH/FP guidelines, manuals, and tools.
  – Expanded contraceptive choice, with introduction of self-injection with DMPA-SC.
  – Higher allocation and utilization of the contraceptive commodity budget.
  – Strengthened infection prevention and control in health facilities.
  – Greater access to SRH/FP services at community level.

- **The political economy is the most important factor determining the ability to influence policies and practices both during and outside a health emergency**: The accountability work in Pakistan was severely constrained before the arrival of the pandemic and continued to be so after its arrival. Due to the political and security environment, it is very difficult for civil society to hold government to account. As a result, the Pakistan team was unable to engage civil society as a way of mitigating the impact of COVID-19. In contrast, Zambia and Madagascar have vibrant civil society, and so were able to leverage it effectively to hold government to account and minimize the disruption to SRH/FP services. In Tanzania, the President's denial of the pandemic meant that the Options team was not able to implement any activities to limit disruption to SRH/FP. The ability to influence health budgets and spend is also heavily dictated by a country's political economy. For example, Zambia, Malawi, and Madagascar successfully leveraged the pandemic to strengthen the case for more and better SRH/FP spend.

- **Civil society accountability mechanisms played an important role in mitigating disruption to SRH/FP services**: Countries that had developed a strong

accountability mechanism were able to leverage it to target advocacy messages generated by the policy and planning, and health financing pathways, to influence government decision-makers at national and sub-national levels. They were also able to successfully harness the media to hold government to account for the continuation of SRH/FP. Using evidence gathered by the civil society organization, the print and digital media were able to show the impact the pandemic was having on SRH/FP service access, especially on adolescent girls. Media stories also made recommendations on how the government could improve service access, for example, through stronger community outreach, use of digital platforms to reach adolescents, and self-care. Another key lesson is the importance of focusing advocacy efforts at both national and sub-national levels. Both Madagascar and Uganda advocacy efforts at regional and district levels resulted in improvements in SRH/FP service access.

- **COVID-19 served to strengthen the case for enabling SRH/FP policies**: Several countries used the pandemic to make a stronger case for their pre-COVID-19 enabling environment work. Both Zambia and Malawi generated evidence on family planning commodity stock out in facilities to advocate for better utilization of the commodity budget and a larger commodity budget. Malawi provided evidence to the Parliamentary Health Committee on the increase in teen pregnancies during the early stages of the pandemic. This served to strengthen parliamentarian support for reforming the Termination of Pregnancy Bill which Options had been working on prior to the pandemic. In Madagascar, the COVID-19 outbreak hastened the launch of self-care, namely the self-administration of DMPA-SC. This helped the country add a significant number of new family planning users during the period June to July 2020, thus helping to slowly regain family planning uptake to pre-COVID-19 levels.
- **SRH/FP systems are more resilient and better prepared for the next health emergency**: The IPC guidelines, standard operating procedures (SOPs), tools, and manuals that Options helped develop or modify are ready for use in a future health emergency. In Bangladesh, health emergency indicators were added to the digital quality of care dashboard as well as the digital financial management system. This work led to the development of two new tools: the first to assess facility readiness to provide SRH/FP services during a pandemic and the second to measure the disruption to stewardship of SRH/FP quality improvement and identify quality gaps. The modified guidelines, new tools, and more resilient systems will enable governments to respond more quickly during the next major infectious disease outbreak, resulting in less disruption to SRH/FP services.
- **The pathway of change is a useful management tool during a health emergency**: The pathways of change tool guided Options teams to identify country-specific support needs during the pandemic. They were able to rapidly pivot their technical assistance toward mitigating the impact of COVID-19 on SRH/FP, while still retaining focus on strengthening government stewardship for SRH/FP and creating resilient and sustainable policies and systems to achieve the sustainability

goals. This required only minor modifications to be made to the milestones, indicators, and goals in the four pathways of change, demonstrating the flexibility of this management tool.

The next section contains more detailed information for each country on: the severity of the COVID-19 outbreak; the COVID-19 intervention and impact, trends in family planning uptake during the outbreak compared to the previous year; and the key takeaway lesson for that country.

Zambia

1. COVID-19 outbreak

(March to November 2020)

Fatality rate:
1.7%

Number of cases :
101/100,000 population

Zambia: Number of COVID-19 cases

Source: Government of Zambia

2. COVID-19 intervention and result

Options advocated to the Parliamentary Committee for Health on the importance of timely release and better utilisation of the allocated family planning (FP) commodities budget to avoid FP contraceptive stock outs, especially during the health emergency.

→ Earlier release of the FP commodities budget and higher fund utilization (67% of the budget was utilised in quarter 3, 2020 compared to 41% the previous year).

3. FP uptake

FP uptake dropped in March and April 2020, followed by a gradual increase in the following months, reaching pre-COVID-19 levels by November.

Zambia: new FP users in 2019 and 2020

■ New users - 2019   ■ New users - 2020

Source: DHIS2

4. Key lesson

The pandemic strengthened the case for more timely release of the FP commodities budget, and for greater utilisation of the allotted funds.

Malawi

1. COVID-19 outbreak

(March to November 2020)

Fatality rate:
2.91%

Number of cases:
156/100,000 population

Malawi: Number of COVID-19 cases

8000
6000
4000
2000
0

M   A   M   J   J   A   S   O   N

Source: Government of Malawi

2. COVID-19 intervention and result

Options advocated to parliamentarians, for an increase to the FP commodity budget during the national assembly budget hearing, making the case that it was even more important to prevent stock outs during the pandemic.

The FP commodity budget increased by 14% from $224,000 to $254,000 for the financial year 2021.

3. FP uptake

FP uptake dropped significantly during April to June 2020 (compared to the same period in 2019), and then slowly rose to pre-COVID-19 levels by October.

Malawi: new FP users in 2019 and 2020

50,000
40,000
30,000
20,000
10,000
0

J   F   M   A   M   J   J   A   S   O   N

■ New users - 2019   ■ New users - 2020

Source: DHIS2

4. Key lesson

The pandemic opened an opportunity for increasing the FP budget.

Madagascar

1. COVID-19 outbreak
(March to November 2020)

Fatality rate:
1.3%

Number of cases :
293/100,000 population

Madagascar: Number of COVID-19 cases

20000
15000
10000
5000
0

M   A   M   J   J   A   S   O   N

Source: Government of Madagascar

2. COVID-19 intervention and result

Options advocated for the immediate launch of self-administration of the injectable contraceptive DMPA-SC as a way of increasing access to FP during the COVID-19 pandemic.

The Government of Madagascar launched DMPA-SC self-injection through virtual platforms the following week and rolled out operational guidelines. This led to a steady rise in new users of DMPA-SC following the launch.

3. Discontinuation of FP

FP discontinuation rates were higher during the pandemic, and only dropped to pre-COVID-19 levels in November.

Madagascar: Dicontinuation of FP in 2019 and 2020

60,000
50,000
40,000
30,000
20,000
10,000
0

J   F   M   A   M   J   J   A   S   O   N

■ 2019   ■ 2020

Source: DHIS2

4. Key lesson

COVID-19 has resulted in higher rates of FP discontinuation. This is likely due to difficulties faced in accessing services during the pandemic. DMPA-SC self-injection will help address these access barriers.

Uganda

1. COVID-19 outbreak
(March to November 2020)

Fatality rate:
0.91%

Number of cases :
105/100,000 population

Uganda: Number of COVID-19 cases

Source: Government of Uganda

2. COVID-19 intervention and result

The civil society organisation working under the accountability mechanism in Bugiri and Kaliro districts conducted a rapid assessment to understand the negative impact COVID-19 on sexual and reproductive health (SRH)/FP service access and shared the findings with the COVID-19 District Task Force.

This led to an easing of restrictions on the provision of community outreach FP services.

3. FP uptake

The number of injectable users dropped in the first two months of the pandemic, and then rose in subsequent months, exceeding the number of users in 2019.

Uganda: Number of injectable users in 2019 and 2020

■ 2019   ■ 2020

Source: Track 20 (FP2020)

4. Key lesson

It is important to focus advocacy at sub national levels, using locally generated data on the impact of COVID-19 on FP access.

Tanzania

1. COVID-19 outbreak
(March to April 2020)

Total cases in March and April:
509

Fatality rate:
4.1%

2. COVID-19 intervention and result

Prepared a set of COVID-19 related frequently asked questions (FAQs) that were intended to be including in the government's COVID-19 guidelines.

→

The guidelines were not released as the government issued a denial of the pandemic in June.

3. FP uptake

Contraceptive prevalence rates remained the same in 2019 and 2020 indicating that COVID-19 did not have a detrimental impact on SRH/FP services.

Tanzania: Modern contraception prevalence rate in 2019 and 2020

■ 2019   ■ 2020

Source: DHIS2

4. Key lesson

The political economy of a country is the most important factor influencing the scope to improve the enabling environment for SRH/FP, both during and outside of a pandemic.

Pakistan

1. COVID-19 outbreak

(March to November 2020)

Fatality rate:
2.04%

Number of cases :
908/100,000 population

Pakistan: Number of COVID-19 cases

500000
400000
300000
200000
100000
0

M   A   M   J   J   A   S   O   N

Source: Government of Pakistan

2. COVID-19 intervention and result

The Government of Punjab province had closed all facilities run by the Population Welfare Department (PWD) due to concerns about COVID-19 infection control. Options supported training in infection prevention control to staff in four districts.

Health facilities were reopened, and SRH/FP services were resumed in these districts following the training.

3. FP uptake

Contraceptive uptake dropped close to zero when the facilities operated by the Population Welfare Department were closed. It picked up once the staff had been trained in infection control and the facilities reopened.

Pakistan: Modern contraceptive prevalance rate in 2019 and 2020

40
35
30
25
20
15
10
5
0

J   F   M   A   M   J   J   A   S   O   N

■ mCPR - 2019   ■ mCPR- 2020

Source: Contraceptive Logistics Management Information System (cLMIS)

4. Key lesson

Strengthening infection prevention control in health facilities should be the highest priority following an infectious disease outbreak to ensure continuation of services.

Bangladesh

1. COVID-19 outbreak
(March to November 2020)

Fatality rate:
1.43%

Number of cases :
283/100,000 population

Bangladesh: Number of COVID-19 cases

120000
100000
80000
60000
40000
20000
0

M A M J J A S O N

Source: Government of Bangladesh

2. COVID-19 intervention and result

Options developed a digital quality improvement dashboard and incorporated a new indicator on infection prevention and control.

→

This has contributed to greater health system resilience and preparedness for a future infectious disease outbreak.

3. FP uptake

Family planning uptake was seriously impacted in the first few months of the COVID-19 outbreak. From September onwards, FP utilisation has gradually increased, and has almost reached pre-COVID-19 levels.

Bangladesh: New FP users in 2019 and 2020

18000
16000
14000
12000
10000
8000
6000
4000
2000
0

J F M A M J J A S O N

■ New users - 2019   ■ New users- 2020

Source: DHIS2

4. Key lesson

Mainstreaming resilience and preparedness into on going health systems strengthening work is important.

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Chapter 7
COVID-19 Vaccine Development and Administration in India

Drishya Pathak and A. Philo Magdalene

Abstract The authors examine, in great detail, issues related to vaccine development, production, and distribution in India. They discuss the problems related to logistics for reaching vaccines to India's large population. The role of international organizations engaged in vaccine development, procurement, and distribution is discussed.

The development of vaccines for COVID-19 within a ten-month period has been an extraordinary achievement given that in the past it has taken 10–15 years to develop a vaccine. Of the seventy vaccine candidates currently in the pipeline globally, four are available for use. Currently, five vaccine candidates are in different stages of development in India.

India is acknowledged globally to have a robust capacity for developing vaccines. India has also had a long history in organizing and implementing immunization programs for pregnant women and children. However, organizing a national vaccination program for COVID-19 is challenging because of India's large population and fragile health infrastructure.

India rolled-out the COVID-19 vaccination program in January 2021. The state governments have developed plans for the storage and distribution of the vaccine and for the implementation of the vaccination program. Important elements within the program are communications and advocacy that aim to inform the people about the vaccine and its benefits and to encourage them to get vaccinated so that the problem of vaccine hesitancy, a major deterrent, can be prevented.

India and the world are at a critical juncture in the history of the pandemic where the availability of the vaccine shows a glimmer of hope—a light at the end of a dark tunnel.

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129

Background

Severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) is a virus in the order of Nidovirales that envelop the positive RNA strand. This new strain of coronavirus, not previously identified in humans, emerged in December 2019 [1]. COVID-19 is the name given to the disease associated with the SARS-CoV-2 virus. This virus primarily targets epithelial cells in the respiratory and gastrointestinal tracts. The COVID-19 outbreak had spread in over 100 countries before it was characterized as a pandemic by the World Health Organization (WHO) on March 11, 2020. In early October 2020, the death counts due to the virus crossed over 1.04 million with 35.5 million cases reported worldwide. India alone reported 6.69 million which was the second-highest number of reported COVID-19 cases after the United States [2]. COVID-19 was first reported in China as an epidemic in December 2019, and the genetic sequence of the novel coronavirus was shared with the world in January 2020 for developing specific diagnostic and other health products including vaccines. COVID-19 is a highly contagious disease which makes the situation very challenging for the scientific and medical communities. The highly contagious nature of the virus underscores the need for widespread vaccination, once vaccines are available [1]. Since the last 11 months, life has come to a standstill, and the vaccine is, therefore, anxiously waited.

Previous studies revealed how human-to-human disease transmission can cause outbreaks and how the global risk can be increased through large-scale travel and migration [3]. The fatality rate of MERS was 35% [4]. The fatality rate of COVID-19 in India is 1.5% (1.5% of people infected with SARS-CoV-2 have a fatal outcome). Globally, this rate was 2.8% in October 2020. Countries are responding differently to COVID-19 by developing different strategies to address the pandemic. However, one preventive measure that could prove to be a permanent solution to this problem is immunization. In October, 214 countries were infected with COVID-19. Immunizing the entire population of the world needs an immense amount of resources, funding, and global cooperation.

Efforts to develop a vaccine commenced in January 2020 when the WHO along with researchers from several institutions started to develop and test vaccines, standardize assays, and regulatory approaches for innovative trial designs, and define criteria for prioritizing vaccine candidates. The WHO has pre-qualified diagnostics that are being used all over the world. WHO is also coordinating global trials to assess the safety and efficacy of therapeutics for COVID-19. The challenge is to speed up and harmonize the processes to ensure that a safe product can be brought to millions of people worldwide. In the early days of HIV treatment and the deployment of vaccines against the H1N1 outbreak in 2009, it was seen that even when tools are available, they are not equally distributed. Various networks and organizations such as the Coalition for Epidemic Preparedness Innovations (CEPI) and the International Vaccine Institute (IVI) have worked in partnership to develop new strategies for ensuring speedy progress in the development of vaccines to respond to future outbreaks of the Middle East Respiratory Syndrome (MERS), Zika, and other

viruses. The objective was to ensure readiness for emergencies, prevent outbreaks due to re-emerging diseases such as poliomyelitis, and to stockpile vaccines. IVI was founded in 1997. Its first major initiative was to develop a safe, effective, and affordable cholera vaccine. This technology was transferred to India. A partnership with EuBiologics in South Korea helped to produce an optimized OCV product which was more suitable and enabled a higher volume supply and uptake [5]. That is how India expanded its vaccine-manufacturing capacity to meet international demand.

The WHO has, time and again, reviewed its role in improving global vaccine access, procurement, and immunization coverage. The international collaborating partners provide updates on the product, price, procurement, the pre-qualification for vaccines, the control of neglected tropical diseases, particularly the new rabies elimination initiative, and regulatory convergence proposals to accelerate vaccine registration in developing countries [6]. India is leading vaccine manufacturing as a part of the Developing Countries Vaccine Manufacturers Network (DCVMN) (Box 1) which is a public health-driven alliance representing vaccine manufacturers from countries engaged in research, development, manufacture, and supply of vaccines for local and international use. The DCVMN-affiliated manufacturers are currently using various technology platforms for developing large-scale manufacture and supply of COVID-19 vaccines [1]. It is essential to work with international organizations such as WHO, United Nations International Children's Emergency Fund (UNICEF), Pan American Health Organization (PAHO), CEPI, IVI, and Global Alliance for Vaccines and Immunization (GAVI) as individual countries cannot manufacture and distribute, in a reliable time frame, the huge number of doses would be needed. Furthermore, expertise to develop, test, manufacture, and distribute the vaccine is scattered around the world which makes it imperative for countries to work together and to share their expertise for delivering adequate quantities of reliable and tested vaccines to everyone (Fig. 7.1).

This COVID-19 pandemic has unknotted many of the gains that India made with vaccination campaigns for polio, cholera, measles, diphtheria, and meningitis. In 1997, with the support of IVI, India revealed its potential for manufacturing vaccines. Serum Institute of India (SII) developed the first meningitis vaccine which was pre-qualified by WHO in 2010 [7]. The world's first typhoid conjugate vaccine (TCV) by Bharat Biotech International was launched in 2013 [8]. The multi-dose inactivated polio vaccine (IPV) from Bilthoven Biological was released in 2017. The first fully liquid hexavalent vaccine based on whole-cell pertussis was developed by Panacea Biotech of India, in the same year in 2017. The Serum Institute of India developed the first thermostable rotavirus vaccine [9]. All vaccines are pre-qualified by WHO. India is the only country in the DCVMN network that has as many as 23 pre-qualified vaccines.

In early June 2020, the WHO declared COVID-19 as a pandemic requiring a rapid response. Through direct communication with network members, online search, and an internal survey, certain indicators like engagement of developing countries vaccine manufacturer's network members in the research and development of COVID-19 vaccines and their capacities in the manufacturing and distribution of vaccines were assessed [1]. As a result, a dedicated facility called COVID-19 Vaccine Global Access
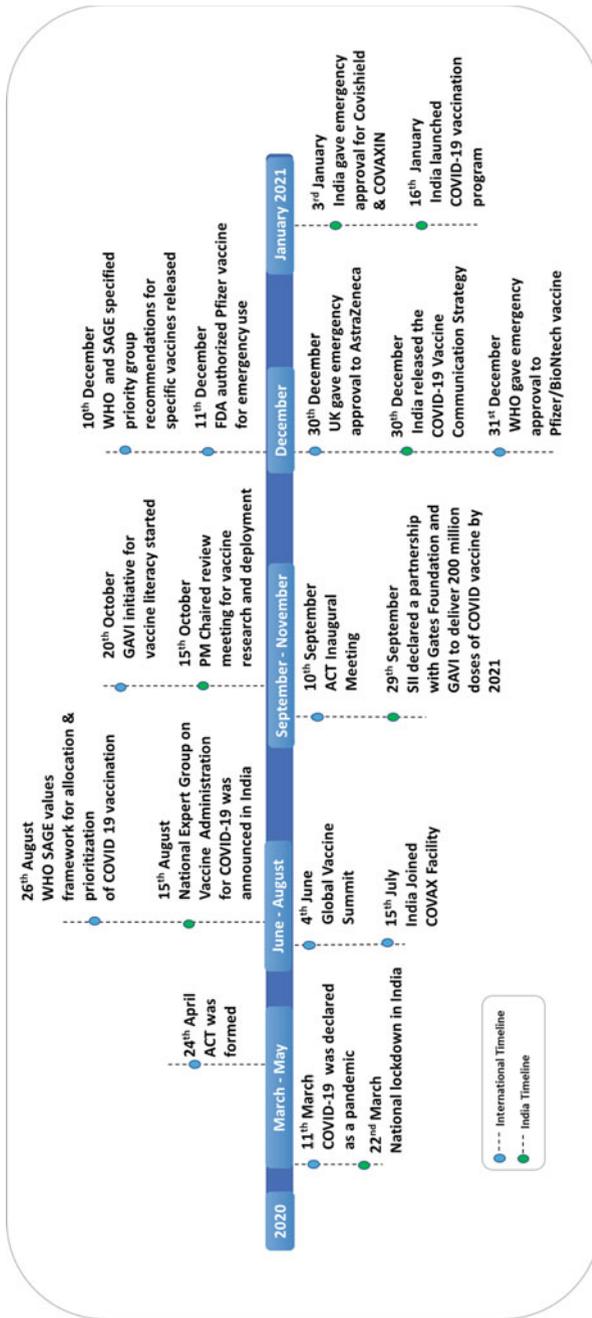
Fig. 7.1 Timeline of major COVID vaccine development events in India. *Source* Compiled by Author

Facility (COVAX) was formed. The role of COVAX is to provide support for the procurement of vaccines through GAVI. India plays a leading role in the COVAX Advance Market Commitment (AMC), the Vaccine Alliance, and the Coalition for Epidemic Preparedness Innovations (CEPI) leading the research and development of vaccines. The WHO has also developed a framework called access to COVID-19 tools (ACT) accelerator which is the result of a global collaboration of WHO, European Commission, France, and The Bill and Melinda Gates Foundation, to accelerate the development, production, and equitable access to COVID-19 diagnostics, drugs, and vaccines [10, 11]. India is the largest producer of vaccines in the COVAX coalition.

On August 7, 2020, a National Expert Group on Vaccine Administration for COVID-19 was formed by the Cabinet Secretariat in India. Its mandate is to identify the right vaccines for use in the country, manage finances for large-scale procurement, and prioritize population groups that will receive the first vaccine doses [12]. The National Expert Group has obtained the structured plan from the states for demand and supply of the COVID-19 vaccine. The total estimated production capacity of India, led by private producers, is three billion doses per year. Indian firms have signed supply and license agreements with Novavax and production agreements with AstraZeneca for 100 million doses of their vaccine. In the run for vaccines, India has two candidate vaccines developed indigenously, COVAXIN and ZyCov-D [13]. In addition to manufacturing, reaching the coronavirus vaccine from manufacturing sites to different parts of the developing world is also an immense challenge that requires a very efficient supply chain as some vaccines require exceptional cold storage. Thus, merely manufacturing vaccines will not be enough to cover the population of India. A study conducted between 2018 and 2019 to measure the sudden increase in measles outbreaks despite safe and affordable vaccine availability showed that such outbreaks occurred because there were pockets of low coverage. Skepticism about vaccines and the highly contagious nature of the disease were other problems [14, 15]. All these challenges will inevitably need to be addressed even when a safe and efficient vaccine becomes available.

Vaccine Development

A vaccine is a biological substance that stimulates the production of antibodies and provides active immunity against infectious diseases. It is prepared from the causative agent of the disease, its products, or its synthetic substitute treated to act as an antigen without inducing disease. Vaccination is a process that aims to generate enough immune cells and antibodies specific to the disease to provide long-lasting protection against the disease. Initially, the immunoglobulin M (IgM) antibody is produced in small amounts. After a few days, the immune response begins to make an immunoglobulin G (IgG) antibody which is more specific to the microbe. An antigen, on subsequent administration, stimulates a secondary immune response which is much faster and lasts longer [16]. The different types of vaccines that are available are

live attenuated, inactivated (killed antigen), sub-unit (purified antigen), and toxoids (inactivated compounds).

Scientists are also working on the next-generation vaccines such as DNA and RNA vaccines and viral vector vaccines [17] (Fig. 7.2). The characteristics of these vaccines determine how they work and how many doses are required to generate an immune response [16]. For the COVID-19 vaccine, scientists are exploring different types of vaccine approaches. As COVID-19 is a viral disease, it is very difficult to find its weak spot for developing a vaccine. Viruses also mutate making it harder for the immune system to launch a counter-attack as seen in the case of HIV/AIDS [17]. Although scientists have tried to estimate how contagious COVID-19 is, the accuracy of some diagnostic tests is still not up to the mark. Current estimates suggest that the average number of people that a contagious person can infect is one to seven. A person with measles can infect 11–16 people on average [18].

Types of Vaccines	DNA and RNA	Live attenuated	Inactivated	Subunit	Viral vector
How it works	This vaccine uses DNA or RNA molecules to teach the immune system to target key viral proteins.	This is a weakened version of the actual virus	An inactivated vaccine uses the whole virus after it has been killed with heat or chemicals	This vaccine uses a piece of a virus' surface to focus the immune system on a single target	This approach takes a harmless virus and uses it to deliver viral genes to build immunity.
Properties	Easy and quick to design but never been done before	Stimulate a robust immune response without causing serious disease	Easy to make, safe. Not as effective as a live virus	Focuses the immune response on the most important part of the virus for protection and might need other chemicals to be added	Live virus tend to elicit stronger immune responses than dead viruses. Needs a viral vector that is truly safe
Existing Examples	None	Measles, Mumps and Rubella Chickenpox	Polio	Pertussis Hepatitis B Human papillomavirus (HPV)	Ebola Veterinary medicine
Group testing approach for COVID-19	• Moderna and Pfizer (RNA) • Inovio (DNA)	• Codagenix • Indian Immunologicals Ltd.	• Sinovac • Sinopharm • Covaxin	• Novavax • AdaptVac	• University of Oxford & AstraZeneca • CanSino Biologics • Johnson & Johnson

Fig. 7.2 Types of coronavirus vaccines approaches. *Source* Centers for Disease Control and Prevention, National Institute of Allergy and Infectious Diseases, and U.S Food and Drug Administration

Research and Development of Vaccines

Of more than 170 candidate vaccines developed by various manufacturers and academic institutions worldwide by the end of December 2020, three COVID-19 vaccines had arrived; the rest were still in different clinical trial phases [19]. Eight of the 19 members of DCVMN manufacturers developing COVID vaccines have had vaccines prequalified by WHO in the past. Every vaccine undergoes clinical trials before it is made available to the general population. Figure 7.3 shows the difference between the previous traditional timeline of ten to fifteen years that was required for vaccine development versus the COVID-19 vaccine development cycle which is completed in 12–18 months. Hatchett's study findings were used for preparing the initial proposals for the Middle East Respiratory Syndrome (MERS), Lassa, and Nipah virus vaccines, thus justifying the proposed COVID-19 vaccine production cycle timeline. There are both rewards and risks of expediting COVID-19 testing and vaccine development, but nobody is sure of either [20].

In India, there are currently 30 vaccine candidates in different stages of development. Out of these, two are in the most advanced stage. These are Covishield from SII and COVAXIN from the Indian Council of Medical Research (ICMR) and Bharat Bio-tech collaboration [21]. All trials are led by the ICMR and the National AIDS Research Institute (NARI) in Pune. In addition to the vaccines shown in Table 7.1, the Department of Biotechnology (DBT) and the Department of Science and Technology (DST) are supporting more than 20 vaccine candidates that are in different stages of
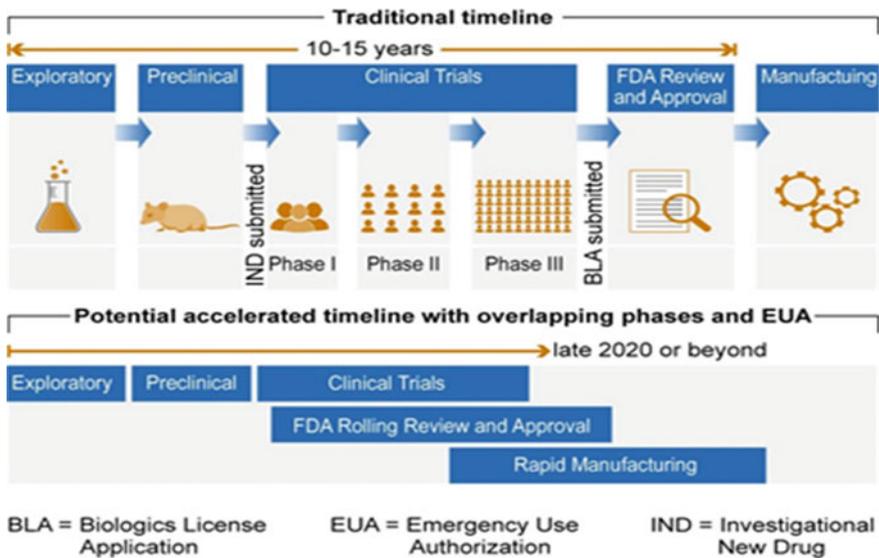

Fig. 7.3 Five phases of vaccine development from preclinical phase to approval phase. *Source* US Government Accountability Office (GAO) analysis of GAO-20-215SP

Table 7.1 Top eight potential COVID-19 vaccine candidates from various countries and networks

S. No.	Name of the vaccine	Current phase in India	Network	Country	Type of vaccine	Timing of doses and mode of administration
1	Sputnik V	Multi-center, Phases II and III adaptive human clinical trial ongoing	Gamaleya Research Institute of Epidemiology and Microbiology along with the Russian Direct Investment Fund (RDIF)	Russia	Adenovirus vector vaccine	0, 21 days, as 0.5 ml dose, intramuscularly (IM)
2	PiCoVacc	Phases II and III	Sinovac Biotech	China	Inactivated and mixed with adjuvant	0, 14 day, intratracheal route
3	AD5-nCoV	Phases II and III	CanSino Biologics	China	Adenovirus-based	Single dose, intermuscular injection
4	ChAdOx1-n CoV-19/Covishield	Phase III and emergency authorization license approved	AstraZeneca/Oxford University produced by Serum Institute of India (SII)	Britain and India	Non-replicating adenovirus type 5 vector vaccine	Two doses with second dose given between 4 and 12 weeks after the first, intramuscular injection (IM)

(continued)

Table 7.1 (continued)

S. No.	Name of the vaccine	Current phase in India	Network	Country	Type of vaccine	Timing of doses and mode of administration
5	BBV152/COVAXIN	Phase III and emergency authorization license approved	Bharat Biotech in collaboration with ICMR and NIV (Pune)	Hyderabad, India	Inactivated whole virion candidate vaccine	0, 28 days, intermuscular injection
6	ZyCoV-D	Phase III human trial ongoing	Zydus Cadila	India	DNA plasmid vaccine	0, 28, 56 days, intradermal
7	NVX-CoV2373	Phase II	Novavax vaccine manufactured by SII, India with annual production of a billion doses	USA and India	Glycoprotein sub-unit (recombinant protein) nanoparticle adjuvanted vaccine (matrix M)	0, 21 days, intermuscular injection
8	BNT162	Phase III and applied for emergency authorization license	Pfizer/BioNTech	USA	Three lipid nanoprotein mRNAs	0, 28 days, intramuscular injection

development [12, 22]. The majority of the vaccine candidates would be available in multi-dose vials (2.5, 10, 20, and 50 doses per vial) [23]. Of these vaccine contenders, six are in the clinical trial phase. The rest are in the preclinical trial phase [24].

The top contenders are the Covishield, COVAXIN, and Sputnik V. Covishield, a non-replicating adenovirus type five vector vaccine, is currently in Phase III human clinical trials in India. COVAXIN, an indigenously developed whole virion inactivated vaccine, is also in Phase III human clinical trials. Both these vaccine candidates were formally approved by the Central Drugs and Standards Committee (CDSCO) on January 3, 2021 [24, 25]. In the first week of August 2020, Sputnik V vaccine completed the Phase II trial successfully and entered Phase III. This Russian vaccine, developed by Gamaleya Research Institute, is built on a common cold virus and has shown to prod the immune system into producing antibodies. India is hosting larger human trials and will also manufacture this vaccine [26]. The Pfizer vaccine, developed by a German firm BioNTech, uses mRNA vaccine platform technology and has received two billion dollars from the US for 100 million doses [27]. Information related to potential vaccine candidates including names of the vaccines, manufacturers' details, type of vaccines, doses of vaccines, phase of vaccine development, and the mode of administration is provided in Table 7.1.

In January 2021, the Government of the UK started a mix and match trial of Pfizer and AstraZeneca to give patients and doctors a wider choice of prevention approaches. Various other combination trials have been conducted such as the Sputnik V and AstraZeneca COVID-19 vaccine trial which is no less than a gamble and contradicts previous guidelines [28].

Figure 7.4 shows the mode of administration for candidate vaccines, which would be a concern once the vaccines are developed. Intratracheal and intranasal vaccines are easy to administer as they do not need trained health workers to administer them. The vaccines that are administered intramuscularly can increase vaccine hesitancy; the mode of administration could be a reason for lower vaccine uptake. Except for a few freeze-dried products, the majority of the vaccine are in liquid form. They have to be administered by intramuscular injection as two-dose regimens [23].

Once the Phase I trial is completed, test license permission is required for manufacturing the COVID-19 vaccine for the preclinical test, examination, and analysis. This license is issued by the Central Drugs Standard Control Organization (CDSCO) in India. CDSCO has so far issued licenses to eight manufacturers in India [22]. Currently, the license is issued to the SII in Pune, Cadila Healthcare Ltd. in Ahmedabad, Bharat Biotech International Ltd. in Hyderabad, Biological E Ltd. in Hyderabad, Reliance Life Sciences Pvt Ltd. in Mumbai, Aurobindo Pharma Limited in Hyderabad, and Gennova Biopharmaceuticals Limited in Pune.

Leveraging Technology

One of the evident changes during the pandemic was that technology was leveraged which benefited the world in many ways. It allowed us to function from different
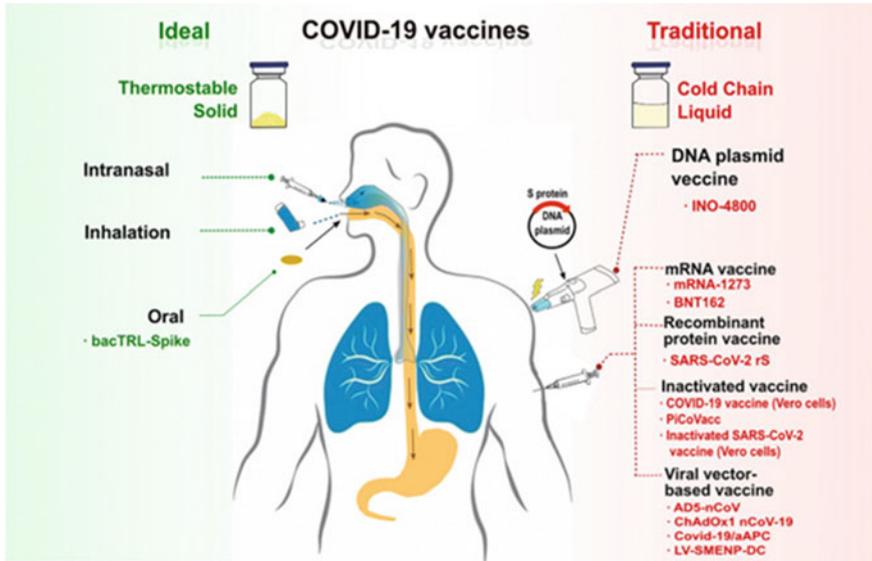
Fig. 7.4 Comparison of routes of administration of the ideal vaccines and the current COVID-19 vaccine candidates. *Source* National Center for Biotechnology Information

regions of the world without the hassle of travel. It made work from home possible. Technology also enabled the dissemination of factual information to create awareness, and, more importantly, it provided the opportunity to make quick connections for working together during the crisis.

International bodies such as The Guardian [19], the London School of Hygiene and Tropical Medicine [29], and others have developed a 'Vaccine Tracker,' similar to the WHO COVID-19 infection tracker, to fast-track vaccines against COVID-19 vaccines. As India is on the forefront of vaccine manufacturing, the Indian Council of Medical Research (ICMR). India's apex health research body has developed an online portal which provides information on COVID-19 vaccine development in India and abroad. This information is provided in several languages, in addition to English [30]. In India, the Prime Minister indicated that a digital health card program generating a Health ID, under the National Digital Health Mission (NDHM), would be deployed to ensure rapid immunization [31]. The Government of India launched a portal called CSIR Ushered Repurposed Drugs (CuRED) to provide information about tracking drugs, diagnostics, and devices as well as the current stage of clinical trials, partner institutions, and their role in the trials [32]. This signifies the interest of the Indian government in using technology for research and development of vaccines. The use of technology for vaccines is also vital for vaccine distribution and management.

India and International Alliances Fighting the Pandemic

Since as many as 214 countries are battling COVID-19, international cooperation and commitment are essential. Global leadership and dialog are needed to establish a coordinated strategy to harmonize regulatory requirements for meeting the demand. India's support to its neighbors and to its partner countries developing COVID-19 vaccines can be gauged by its commitment and participation in the various alliances that have been formed globally. India plans to leverage domestic vaccine-manufacturing capacity and engage with all international players for the early delivery of vaccines not only in India, but also in other low- and middle-income countries [33].

India is a part of several global alliances including the COVID-19 Vaccine Global Access Facility (COVAX), ACT Accelerator, and DCVMN. COVAX, an initiative of 190 countries under the ACT accelerator, pools economic resources of its member countries to enable equitable access to the vaccine.

India has a central role in COVAX both as a mass producer of vaccines and as a regional leader. Although this engagement has been undermined by economically powerful countries such as the USA, China, and Russia, India can still use its diplomatic ties with its neighboring partners to develop manufacturing hubs that will further bring down vaccine prices and enable better local access to vaccines. India can also bring in countries that are not members of the consortium since it has the largest vaccine-manufacturing capacity of any single country [13].

Canada has reserved 350 million vaccine doses for a population of just over 38 million which equates to nine doses per person; it has a guaranteed supply from Pfizer and Moderna from the USA [34]. Australia has an agreement with AstraZeneca [13]. Currently, all these tie-ups are very unstable but can, in the future, divert a part of the already limited collective manufacturing capacity of these companies. And these tie-ups can also affect the ability of the private sector to supply vaccines [13]. As the vaccines are getting ready for rollout, 7.25 billion doses have already been pre-purchased by countries and organizations. India has ordered 500 million doses from AstraZeneca and one billion from Novovax. India has leveraged the power of its manufacturing agreements with the vaccine producers to pre-purchase 20% of the global share of vaccines. However, even this will not be sufficient to vaccinate India's population [34].

Access to COVID-19 tools (ACT) accelerator is a ground-breaking global collaboration for accelerating the development, production, and equitable access to COVID-19 tests, treatments, and vaccines [35]. It is a framework to reduce the COVID-19 mortality rate with its investment plan which is being published by the organizations and includes the following three 'pillars' which show a path to accelerated development, equitable allocation, and scaled-up delivery of vaccines, therapeutics, and diagnostics.

The members of this group, committed to ensuring that all people have access to all the tools needed to battle COVID-19, work with partners to achieve this goal [36]. The goals of the three pillars are to make 500 million diagnostic tests available

to low- and middle-income countries (LMICs), by mid-2021, provide 245 million courses of treatment to LMICs by mid-2021, and provide two billion vaccine doses, of which 50% will go to LMICs, by the end of 2021 [36] (Fig. 7.5).

Another network that India is supporting is the Developing Countries Vaccine Manufacturers Network (DCVMN) which provides a platform for organizations to
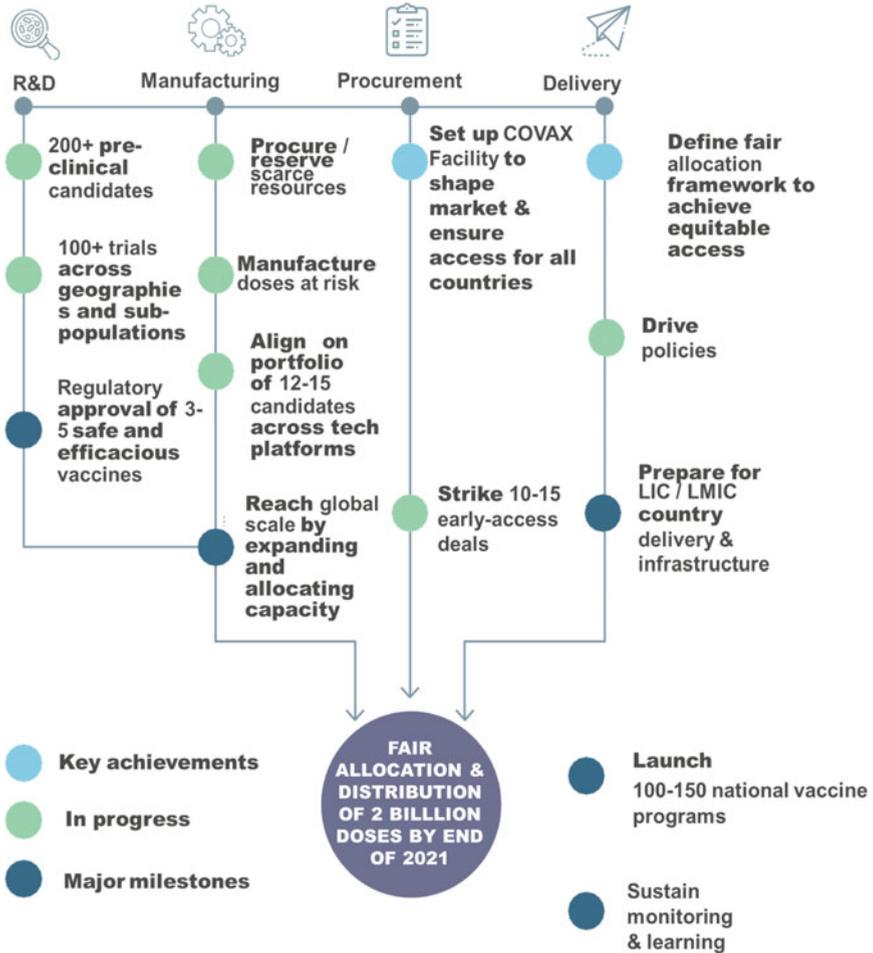

Fig. 7.5 ACT accelerator vaccines pillar (COVAX) priorities critical path. *Source* Status Report and Plan September 2020—December 2021. World Health Organization

come together regularly to share technical information, best practices, and prospects (Box 1). The network members have 181 vaccine projects in the research and development pipeline including vaccines against mosquito-borne diseases such as dengue, chikungunya, Zika, novel human papillomavirus, and pneumococcal conjugate vaccines. DCVMN has made progressive efforts with its members, particularly in the past five years, to contribute to reducing the burden of infectious diseases globally [37].

Box 1. Developing Countries Vaccine Manufacturers Network

The Developing Countries Vaccine Manufacturers Network (DCVMN) is a public health-driven alliance of corporate vaccine manufacturers as defined by the United Nation's World Economic Situation and Prospect Report [38]. It is a unique international alliance of public and private organizations. It was formed in the year 2000 by ten vaccine manufacturers motivated by WHO and GAVI alliance. It aims to improve vaccine supply to developing countries where populations have been growing rapidly, the incidence of disease is high, and purchasing power is low. DCVMN is at the frontier to help solve the challenges which the emerging vaccine industry faces. The mandate of the network is to protect all people against known and emerging infectious diseases by improving the availability of high-quality vaccines globally. It recognizes the need for international scientific, technical, and economic cooperation [37]. Currently, there are 43 DCVMN members from 14 countries and territories. As of October 2019, 15 vaccine products of the member countries have been pre-qualified by the World Health Organization. In 2018, DCVMs supplied over 50% of the 2.36 billion doses of vaccines procured by UNICEF globally. These were valued at USD 1.453 billion and were GAVI-financed vaccines.

India has the highest score of pre-qualified (PQ) vaccine among all the DCVMN countries with 23 pre-qualified till December 31, 2019. Indonesia has 15 PQ vaccines [39].

While broad knowledge, research, and development are key to achieving an effective and safe vaccine, massive manufacturing requires global networks and countries around the world to support each other assuming that there is the high demand for the vaccine. To commence immunization globally and deploy available facilities, efficient and safe vaccines with efficient manufacture, distribution, and surveillance are key for saving time, resources, and most importantly, lives.

Vaccine Surveillance

The vaccine will hit in waves even after it has reached Phase IV as each candidate in the pipeline has its own timelines and distribution requirements. Therefore,

governments are planning to rollout vaccines in a phased manner, targeting the most vulnerable groups early. Throughout the process, including the clinical trial phases and also when the vaccine is introduced for the general population, long-term and high-quality surveillance is needed to monitor the impact of the vaccination program and the changes in disease prevalence. Vaccine surveillance involves monitoring vaccine safety by performing high-quality safety trials, assessing the determinants of possible adverse reactions, and learning about preventable risk factors through public health surveillance [40].

Maintaining surveillance and laboratory capacity allows countries to leverage resources for monitoring other vaccine-preventable and non-preventable diseases. Maintaining diligent records of who received the vaccine, the lot number of the vaccine, number of vaccines scheduled for the next dose, and adverse effects, if any, particularly when vaccinating those with comorbid conditions, will be important to understand the impact of preexisting conditions and the effectiveness of the vaccine. Given the expedited nature of the COVID-19 vaccine trials, it will become a necessary attribute of the vaccination drive, as these vaccines are not tried on specific targets during the clinical trials [41]. Hence, a national identifier is required for COVID-19 immunization case tracking. The data collected will also be important for monitoring and responding to outbreaks and pandemics in the future. This was done in 2008 when WHO developed a network of regional surveillance and established standardized global sentinel hospital surveillance for rotavirus and invasive bacterial vaccine-preventable diseases (IBVPDs). The data collected described the disease burden for making decisions about rotavirus and pneumococcal conjugate vaccine (PCV) introduction and also showed short- and long-term impact globally, especially in regions with surveillance gaps for the rotavirus and pneumococcal conjugate vaccines. The vaccine surveillance platform data could also be used to leverage and monitor other vaccine-preventable diseases (VPDs).

The vaccine surveillance system can be helpful in many ways. To name a few, it can provide evidence for future studies, generate responses for similar outbreaks, and help to decide who should be vaccinated first—either to reduce mortality by vaccinating the elderly or to limit the spread of infection by vaccinating the working age population. It can also be helpful at the international platform. A study by GAVI in 2017 revealed that being a part of the VPD surveillance network provided benefits to countries through technical support and training in epidemiology and data management. It also provides linkages with partners, opportunities for network activities including research (e.g., the global pediatric diarrhea surveillance project), and in some cases, funding. Thus, the administration of the vaccine in a phased manner can enhance vaccine surveillance by offering continuous learning about the effectiveness and side effects of the vaccine.

Vaccine Supply, Stocking, and Financing

Government manufacturers need to ensure that there is adequate infrastructure for vaccine storage, handling, and transport even before the vaccine is ready for distribution. Vaccines are fragile and need to be stored at recommended temperatures and to

be protected from light at every link in the cold chain. Vaccines exposed to temperatures outside the recommended ranges can result in reduced potency resulting in wastage of vaccines which is expensive. Therefore, with the current capacity in India of 28,932 cold chain points and 85,622 equipments, the government needs a solid action plan that involves governing bodies, manufacturers, and other stakeholders and uses the latest tested technologies and interventions.

India Action Plan

On August 15, 2020, Independence Day, the Prime Minister, while addressing the nation, announced that a blueprint for the production and distribution of the vaccine in the country was ready. Thereafter, the National Expert Group on Vaccine Administration for COVID-19, chaired by Vinod K Paul, a member of the National Institution for Transforming India (NITI) and co-chaired by the Union Health Secretary Rajesh Bhushan, was constituted [33]. In the same month, the WHO Strategic Advisory Groups of Experts on Immunization (SAGE) released a values framework for the distribution and prioritization of COVID-19 vaccination. The values framework provides guidance to policy-makers at the global, regional, and national levels, on the importance of using the best available science in epidemiology, public health, and economics while making the distribution plan. The values framework has six principles: human well-being, equal respect, global equity, national equity, reciprocity, and legitimacy. It also has twelve objectives for COVID-19 vaccine deployment [42]. The National Expert Group has developed a strategy for COVID-19 vaccine availability and delivery. The National Expert Group will take responsibility for the conceptualization and implementation of mechanisms for the creation of a digital infrastructure for inventory management and delivery mechanism of the vaccine, including tracking of the vaccination process, with particular focus on last mile delivery [12, 33].

The roles and responsibilities of the National Expert Group include

1. With the inputs and support of the Ministry of External Affairs (MEA), the National Expert Group facilitates Indian companies to develop vaccine candidates that they are interested in and also helps to provide relevant data to regulatory agencies [43].
2. The National Expert Group is responsible for keeping India on the forefront of ongoing global efforts to innovate, prepare, produce, and launch vaccine candidates to deal with the COVID-19 pandemic in India and the world [43].
3. The National Expert Group provides relevant testing data and helps to evaluate all vaccines.

The National Expert Group on Vaccines Administration for COVID-19 conducted a series of meetings since its inception in August 2020 to discuss broad parameters guiding the selection of COVID-19 vaccine candidates for the country and sought inputs from the Standing Technical Sub-Committee of the National Technical Advisory Group on Immunization (NTAGI). Along with NTAGI, the National Expert

Group determined the procurement mechanisms for the COVID-19 vaccine and mobilized resources required for financing the vaccines [33]. The National Expert Group, along with the sub-committee of NTAGI, is responsible for preparing the guiding principles for prioritizing population groups for vaccination. India's vaccination plan has identified approximately 30 crore (300 million people) that includes healthcare workers, the elderly, and people with comorbidities, to be vaccinated in Phase 1 and thus would require approximately 70–80 crore (700–800 million) doses for complete vaccination with the two doses and some wastage in transit [44]. The National Expert Group also ensures equitable and transparent delivery of the vaccine, addresses issues related to vaccine safety and surveillance, and coordinates both indigenous and international vaccine manufactures. It is also responsible for determining options in terms of delivery platforms, cold chain, and strategy for community involvement, by providing information and generating awareness and associated infrastructure for the rollout of the COVID-19 vaccine [12, 33]. The National Expert Group ensures that states do not procure vaccines through individual pathways. Two vaccine candidates, Covishield and COVAXIN, have been given emergency use authorization [24].

India is a member of the COVAX, ACT accelerator, DCVMN, and others fighting the pandemic. It led these groups in manufacturing vaccines, even before COVID-19 was declared a pandemic. India supports a domestic vaccine industry by setting up vaccine production facilities in other countries as well. India is exploring South Asian and African nations as destinations to create goodwill through scientific outreach. Africa accounts for only 0.1% of the world's vaccine production even though it has a high prevalence of infectious diseases. There are other regional trading blocks like the East African Community, the South African Development Community, and the Economic Community of West African States that could be engaged for a COVID-19 vaccine and other vaccines relevant to Africa's needs while meeting world demand [13].

The Indian government proposes to work on the following five distinct strategies for vaccine management after vaccines are manufactured:

1. Free distribution to immediate neighbors such as Bangladesh, Afghanistan, and other South Asian Association of Regional Cooperation (SAARC) countries.
2. Heavily subsidize supplies as a part of India's international commitment for equitable distribution. Many African nations could benefit from this.
3. Strike market price purchased deals and provide guarantees for the supply of vaccines to countries.
4. Approach other countries for undertaking trials of Indian vaccines candidates.
5. Approach countries to co-produce Indian vaccines once approved [12].

Currently, Indian manufacturers are waiting for the government's requirements that include initial procurement volumes, financial aid or support to scale-up manufacturing, and the stage at which the government will deliver on the commitment that it has made through the National Expert Group. The major players in India are representatives from SII, Bharat Biotech, Zydus Cadila, Gennova Biopharmaceuticals, and Biological E (BEL).
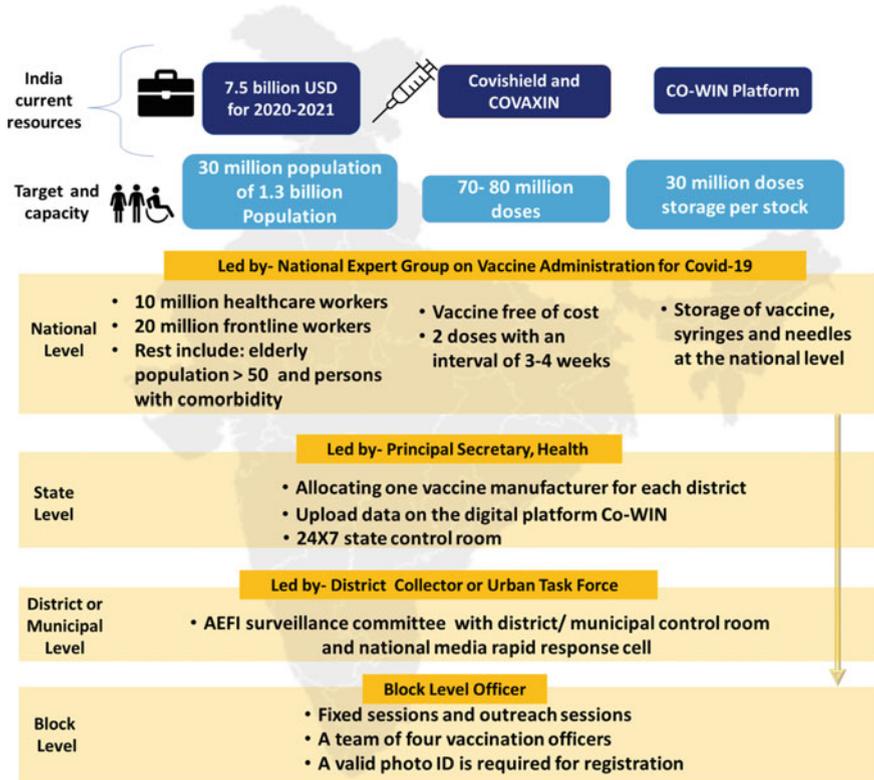
Fig. 7.6 India action plan for COVID-19 vaccine deployment. *Source* Compiled by Author

The world's biggest COVID-19 vaccination program started in India in the month of January 2021. The program has four elements that include use of the digital platform Co-WIN, the formulation of an administration plan for vaccine logistics, cold chain management, communication and social mobilization, and recording adverse events following immunization (AEFI). Surveillance is undertaken at multiple levels [45] (Fig. 7.6).

Logistics, Management, Distribution, and Data Management

For implementing the COVID-19 vaccination program, two mammoth tasks that cannot be ignored are putting together an efficient cold chain mechanism and a system for data management. Several United Nations organizations are procuring a large number of syringes to meet the demand. UNICEF is pre-positioning syringes and other necessary equipment and plans to procure approximately one billion syringes and safety boxes by 2021. The demand is for 620 million syringes that will be

purchased for vaccinations against other diseases. GAVI and the Vaccine alliance will reimburse UNICEF for this procurement as it is a part of the COVAX facility [46]. India needs to do similar planning for the distribution of vaccines. The India Action Plan will include community cold chain networks by combining agricultural and medical cold chains wherever possible. But the biggest question is the development of vaccine presentation and packaging that optimize their affordability and programmatic ease of use in India as well as in other countries that have heavy burden of under-vaccinated people.

India will have to leverage its growing technological capabilities and tools to improve its vaccination rates and reverse the damage caused by COVID-19. India's vaccination system, according to the Universal Immunization Program (UIP) plan for 2018–2022, is supported by more than 27,000 functional cold chain points of which only 750 (3%) are located at the district level and above. The rest are located below the district level. There are 2.5 million healthcare workers, 55,000 cold chain staff, and 76,000 freezers, refrigerators and other cold chain equipments, which are still inadequate for a population of 1.3 billion [47]. A social–ecological model-based framework, at the individual, community, and societal levels, will be needed to achieve sufficient immunization coverage [48]. To achieve this, the Indian government conducted a massive exercise to map out cold chain storage facilities across the country. To secure 'the last mile connectivity' and ensure that nothing goes wrong before the shot is administered, the National Expert Group has been working to pool the database of all public and private sector entities. The National Expert Group includes stakeholders who are a part of the pharmaceutical, food processing industry, the agro-businesses sectors as well as food delivery start-ups such as Swiggy and Zomato, to identify cold storages facilities such as fridges that can stock and distribute the vaccine at the *taluka* level [23]. To monitor the vaccine supply chain, beneficiary enrollment, and delivery system of the vaccine, Rajesh Bhushan, Health Secretary initially suggested use of Electronic Vaccine Intelligence Network (eVIN) [49]. However, a model similar to the Electronic Vaccine Intelligence Network (eVIN) was developed and deployed to distribute the COVID-19 vaccine. This is called the COVID vaccine intelligence network 'Co-WIN'. eVIN currently monitors vaccine supplies, and the 25,000 cold chain points across the country in real-time.

eVIN has been enhanced to monitor the vaccination drive and to track the listed beneficiaries for vaccination in real time. It has been named Co-WIN. The Co-WIN app has two parts—one for the use of the beneficiary and the other is the back-end module for vaccinators [45]. The application can be downloaded free of cost. It is also used to provide a QR code generated beneficiary acknowledgment certificate. All the data from the block level is transferred in real time to the central server.

Box 2. Electronic Vaccine Intelligence Network (eVIN)

The Electronic Vaccine Intelligence Network (eVIN) is an Internet-based distribution system. It is an indigenously developed technology that digitizes vaccine

stocks and monitors the temperature of the cold chain through a smartphone application. This technology was introduced to support the Universal Immunization Program. All cold chain handlers are provided smartphones with the eVIN application that allows the digitization of vaccine inventories. Every cold chain handler enters the net utilization of each vaccine at the end of every immunization day. This information is uploaded on the cloud server and can be viewed by program managers at the district, state, and national level through an online dashboard [50].

Variance in temperature during storage, handling, and transportation of the vaccine is major concern for global logistical strategies as millions of vaccine doses have to be transported from country to country and within the country itself.

The following are the elements for storage and transportation of vaccines:

1. Transportation vehicles fitted with freezers.
2. Freezers at the warehouses.
3. Freezers at hospitals and clinics.
4. Availability of dry ice, a by-product of ethanol production, can reduce the load on freezers. Ethanol production is dependent on gasoline demand which has dropped in the last eight months.
5. Life of the vaccine outside the freezer is also a potential challenge.
6. The other parts of the vaccine distribution puzzle are vials, stoppers, gauze, and alcohol swabs. These should be made available even before the vaccine reaches the public. Vaccine vials should be sterilized. They should be designed in such a way that they can withstand below-freezing temperatures. No compromise can be made in quality.

The temperature of the freezer should be between -50 and -15 °C, and the temperature of the refrigerator needs to be between 35 and 8 °C with the average temperature being 5 °C.

The ideal vaccine for a country like India and other such countries would be a ready-to-use dosage form which means that it would have a long shelf life when stored at ambient temperatures. Vaccines lose potency when exposed to higher temperatures. Re-cooling does not help especially with large numbers of doses. The vaccines currently available require refrigerated storage at $+2$ to $+8$ °C. Maintaining vaccines in a cold chain is challenging for both developed and developing countries as the cold chain alone contributes 80% of the total vaccination cost [47, 51]. The AstraZeneca-Oxford vaccine would pose less of a logistical challenge for India as it requires temperatures of $+2$ to $+8$ °C that can be achieved with most commercial freezers [13].

Apart from vaccine availability and coverage, the even bigger challenge for India is generating awareness to overcome vaccine hesitancy. The government needs to work with civil society organization (CSOs) to provide accurate information to the public

about the vaccine and to burst myths and misconceptions. CSOs can reach hard-to-reach areas. They can reach mobile/migrants and people belonging to diverse cultural backgrounds with different religions, traditions, beliefs, and customs. Community participation is important for reaching higher levels of immunization. Various interventions can be adapted to countries to generate greater awareness. For example, the Core Group Polio Project in Baghpat, Bhopal, worked with local communities to create awareness on polio and other routine immunizations. As a part of this initiative, it encouraged village leaders to display messages on water tanks [52].

Funding

In order to prevent COVID-19, it is necessary to have a well-allocated budget for vaccine research, development, distribution, and administration. In early May 2020, the government proposed an allocation of Rs. 100 crores (13.67 million USD) from the PM-CARES (Prime Minister's Citizen Assistance and Relief in Emergency Situations) and fund to support the development of the COVID-19 vaccine. This fund will support indigenous vaccines only [53]. With the vaccination cost of Rupees 450–550 (6–7 USD) per person, India has set aside Rupees 51,000 crore (7.65 billion USD) for vaccinating its 1.3 billion population [54]. The government announced a Rupees 900 crore (123.06 million USD) grant for the *COVID Suraksha Mission* that is to be used for vaccine development [21]. In October 2020, the Union Health Minister, Harsh Vardhan, announced that the government expects to receive 400–500 million doses of COVID-19 vaccine that would cover approximately 200–250 million people by July 2021. He also indicated that the states should plan for vaccine storage and distribution, an immensely challenging job [47].

Several international coalitions and national organizations are working to provide equitable access by making vaccines available to low-, low-middle, and middle-income countries. The costed plan presented has called for 31.3 billion USD in funding for diagnostics, therapeutics, and vaccines, of which 3.4 billion USD have been pledged so far [36]. Out of the total amount, 18.1 billion USD are needed globally for the next 18 months for two billion doses to be deployed by GAVI and CEPI by the end of 2021.

Challenges

Ethical Issues

The operational challenge is to ensure that the coverage of the vaccine is equitable [55]. Because of the pandemic, countries are suffering from economic losses that will take years to recover. There will be immense pressure on government to focus

on vaccine manufacturing, distribution, and administration. This will likely result in diverting crucial, but limited, resources to the large-scale production of COVID-19 vaccines and will negatively impact the production of vaccines for other diseases. A survey conducted in June 2020 by UNICEF, GAVI, the Bloomberg School of Public Health, and other institutions found that already established vaccination programs were being interrupted in over 60 of the 85 countries surveyed as governments rushed to address COVID-19 on priority. The study underscored the need to co-opt unused capacity and set up new manufacturing facilities [13].

Another major issue is equitable access to vaccines. Several wealthy countries like the UK, EU, USA, and Japan are displaying nationalistic tendencies by pre-buying large stocks of vaccines for their people and reportedly signing deals to reserve 1.5 billion doses [56]. This may impact availability of vaccines for low- and middle-income countries.

> The nation would need about Rs. 800 billion (10.9 billion USD) to procure and inoculate people living everywhere from the Himalayas to the remote Andaman & Nicobar Islands.
>
> Adar Poonawalla, Head of the Serum Institute of India

Distribution and Administration

In addition to ethical issues, there are other challenges related to the distribution and administration of vaccines. One such challenge is the supply chain. Vaccine wastage, a very common problem, occurs during its distribution and administration. Studies conducted by WHO and UNICEF in different locations have shown a high vaccine wastage rate for various vaccines, ranging from 27 to 61% [57]. Vaccine wastage occurs during the time of administration, outreach, storage, and during the transition to vial dosage sizes. There are five to ten dose vaccine vials [58]. Regular monitoring of vaccine wastage is needed as vaccines are expensive commodities and newer vaccines are even more costly. Wastage of the COVID-19 vaccines can add to the financial burden on the country. Hence, a carefully phased administration strategy is required to avoid vaccine wastage. Other challenges are vaccine coverage, storage, and temperature fluctuations that can affect the shelf life of the vaccine.

Vaccine Hesitancy

Even if the government, international forums, and networks can manufacture the vaccine on time and in a sufficient amount, the issue of low vaccine uptake still exists. Assessing the reason for low vaccine uptake in a population and differentiating between those unvaccinated or under-vaccinated are essential. Vaccine hesitancy is a behavioral phenomenon. It is measured against the expectation of reaching a specific vaccination coverage goal. It is set on a continuum between those who accept all vaccines with no doubts, to those who completely refuse with no doubts [59]. In a

survey conducted during July to September 2020 by the Massachusetts Institute of Technology (MIT) in collaboration with the John Hopkins University, Facebook in 67 countries that included India found that 10% of the total respondents refused to get vaccinated and 15% were not sure. Bangladesh showed the highest confidence in the COVID-19 vaccine [60].

The top three reasons reported by WHO and GAVI for vaccine hesitancy across all WHO regions have consistently been: (1) perception of risks and benefits, (2) lack of knowledge and awareness of vaccination and its importance, and (3) religion, culture, gender, and socioeconomic issues. Studies have found that vaccine hesitancy may be more and vaccine uptake low because of system failures such as stock-outs, limited availability of vaccination services, (time, place), and curtailment of vaccine services during conflicts and natural disasters [59]. Over the years, many reasons have been identified, but they usually boil down to two factors: confidence in the public health system and lack of awareness or misinformation about the vaccine.

> People may not want to get vaccinated because they think the disease is not serious and does not warrant vaccination or they feel the vaccine is not safe. The anti-vaccine sentiment may also vary according to education levels. [61]
>
> Prof K Srinath Reddy, President, Public Health Foundation of India

Concluding Comments

The development of vaccines for COVID-19 within 10 months has been an extraordinary achievement given that in the past it has taken 10–15 years to develop vaccines. Currently, six vaccines candidates are in different stages of development in India. Of these, two have been given emergency approval.

India is acknowledged globally to have robust capacity for manufacturing vaccines. India has formed partnership with all the key international organization that develop and distribute vaccines. India also has a long history of organizing and implementing immunization programs for vaccine-preventable diseases in pregnant women and children. However, organizing a national immunization program for preventing COVID-19 is challenging because of India's large population and fragile health infrastructure.

State governments have developed plans for the storage and distribution of vaccines and implementation of the vaccination program. India has formulated its national action plan and rolled out its vaccination program for COVID-19 in January 2021. Currently, its vaccination program includes two vaccines: Covishield and COVAXIN. Important elements within the program are communications and advocacy to inform the people about the vaccine and its benefits and to encourage them to get vaccinated so that the problem of vaccine hesitancy, a major deterrent, can be prevented.

India and the world are at an important point in the history of the COVID-19 pandemic where the availability of the vaccine shows a ray of hope—a light at the end of a dark tunnel.

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Part II
Impact of COVID-19 on Mental Health, Hunger and Nutrition, Sexual and Reproductive Health and Rights, Gender, and Financing

Chapter 8
A Lifestyle Disorder that Spared Nobody: Mental Health and COVID-19

Komal Mittal, A. Philo Magdalene, and Drishya Pathak

Abstract The authors discuss the mental health problems that emerged during the COVID-19 pandemic. Mental health manifested as a lifestyle disorder that is being experienced by everybody all around the world. The authors discuss a range of mental health problems that are due to COVID-19. Their prevalence and implications are assessed. In order to provide perspective, research from India and other countries is cited. The causes and consequences of mental health problems associated with COVID-19 are analyzed.

In India, mental health problems were on the rise even before the pandemic. The pandemic, however, greatly exacerbated these problems. Stress, anxiety, and depression became a part of everyone's life. No one was spared. Strong public health measures to contain the pandemic including the prohibition of movement and isolation took their toll. Being away from work, school, and peers, adjusting to new ways of working and learning, and dealing with job loss were all stressful. Fake news and miscommunication further fueled the problem.

A large section of the population was forced to re-invent its workplace, often in unfavorable environments, resulting in a deep sense of unease. Research shows that because of uncertainties related to finances, work pressure, and jobs, there was a rise in the number of cases of mental illness. The number of suicides also increased. Research in India and other countries underscores that COVID-19 compounded all these problems. Stringent public health measures imposed by all governments, although necessary for containing the pandemic, had a major impact on the psychological state of people. Fear, anxiety, and anger are some of its psychological consequences. Anxiety producing information in the media accentuated these problems.

Pre-occupation with the pandemic resulted in a neglect of the mental well-being of the patients, healthcare professionals, and frontline workers. This caused psychological distress that varied from panic attacks and collective hysteria to pervasive feelings of hopelessness and desperation including suicidal behavior. The psychological wellness of individuals was influenced unfavorably by lifestyle changes caused by the

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pandemic that included isolation, limited mobility, social stigma, and ever-spreading misinformation and fake news on web-based platforms.

Violence against women and girls was also exacerbated during the pandemic. Violence took place not only within the home but also in other spaces. Violence was severe among migrant workers, health workers, and sex workers. The authors underscore the urgent need for setting- up hotlines, crises centers, shelters, legal-aid, and counseling services.

The pandemic might be the much-needed wake-up call to make long-term improvements in India's healthcare system. It offers an opportunity for India to take greater cognizance of mental health problems and to integrate services to address these problems within the primary healthcare system.

Background

The novel coronavirus which originated in Wuhan, China, resulted in a cluster of unexplained pneumonia cases. It subsequently spread to several countries. The World Health Organization (WHO) declared it as an emergency of international concern in January 2020. Officially designated as COVID-19 by the WHO, this crisis generated unprecedented global action. As COVID-19 spread, updates on information and recommendations were continuously put out by epidemiologists, virologists, global media, international health organizations, and opinion makers [1]. Data on the route of transmission of the virus and the incubation period, symptoms, clinical outcomes, and survival rates of the disease was collected and shared in real time [2].

Following WHO's recognition of COVID-19 as a pandemic, governments all around the world responded by enforcing measures like social distancing and quarantine. Social distancing and lockdown were first carried out in China and then in many European countries including Italy and Spain [3]. Stringent public health measures were implemented to contain the pandemic [4]. Although necessary, these measures had a major impact on the psychological state of the people. The modern world, in which individuals are able to travel frequently and communicate in person, was forcefully restricted leading to feelings of frustration and uncertainty.

The prohibition of almost all non-essential individual movements led not only to a socioeconomic crisis but also to severe psychological distress. Fear, anxiety, anger, and sadness were some of the psychological consequences of isolation. Being far away from school, work, and peers, adjusting to new ways of learning and dealing with job uncertainty and loss of a steady income to support the family resulted in lifestyle changes. Individuals were emotionally unprepared to deal with the COVID-19 pandemic. Psychological reactions such as fear and anxiety were accentuated due to inaccurate, anxiety-provoking information provided by the media [5]. It should be noted that before the pandemic, between 1990 and 2017, one in every seven persons in India had experienced psychological maladjustment which varied from sadness and nervousness to extreme conditions such as schizophrenia. COVID-19

exacerbated the situation. Today, the nation appears to be in a mental health crisis [6].

Due to the burden of infection and other challenges posed by the pandemic, the mental well-being of patients, healthcare professionals, and frontline workers was neglected [2]. With COVID-19 spreading rapidly, nations worldwide were forced to implement emergency protocols as local hospitals began to receive thousands of critically ill COVID-19 patients. This resulted in psychological distress which varied from panic attacks and collective hysteria to pervasive feelings of hopelessness and desperation including suicidal behavior [7–11].

A high prevalence of psychological symptoms, including depression, mood swings, irritability, insomnia, post-traumatic stress, anger, and emotional exhaustion, was reported in those who had been quarantined. Long-term behavioral changes like vigilant handwashing and avoidance of crowds as well as a delayed return to normality even after several months of quarantine have been reported [12]. Quarantine seems to have important dysfunctional psychological consequences on the individual's mental health not only in the short term but also in the long term. Symptoms of hysteria, depression, and self-reported stress are common psychological reactions to COVID-19. It is important to generate awareness and address the need for psychological interventions.

Approach

The authors of this chapter aim to understand the shift in perceptions of the psychological state in India during the COVID-19 pandemic. The authors have explored the factors within the pandemic scenario that facilitated this process. The chapter begins by providing a general perspective on the psychological state during the COVID-19 pandemic. The concept of the psychological state is enunciated. The discussions focus on why attention should be paid to mental (ill) health and which groups are at greater risk. Finally, a general intervention framework for successfully managing psychological problems during and after the pandemic is presented.

A review of the literature on mental health during the COVID-19 pandemic was undertaken. In addition, a review of the electronic database and newspaper articles searching the terms novel coronavirus, nCov, mental health, anxiety, depression, stress, stigma, transformation, violence, and lifestyle relevant to mental health was done. The literature review included articles related to editorials and commentaries on mental health and COVID-19. Observational and cross-sectional narrative reviews were used to summarize the salient themes. This chapter includes an extensive review of observational studies on mental health during the COVID-19 pandemic, articles addressing the psychological impact of COVID-19, and the impact of COVID-19 on the general population including men, women, children, vulnerable groups, and healthcare workers. While most of the literature was sourced from India, studies from countries like United States, UK, China, Iran, Japan, and Singapore were also reviewed to provide a larger context.

Factors Impacting Mental Health

The psychological wellness of individuals was influenced unfavorably due to lifestyle changes caused by the pandemic that included isolation, limited mobility, and ever-spreading gossip on web-based media. Tension among the people resulted in frenzy purchasing, impediments in daily exercise, changes in dietary habits, and restricted socialization. There is clearly a need to manage problems affecting psychological wellness [13]. In India, every section of the population was impacted at various levels. Mental health problems resulted in a lifestyle disorder that spared nobody. A discussion of mental health problems in various population groups is provided here under.

Impact on Frontline Workers and Vulnerable Groups

Social stigma in COVID-19 has become 'normal' as is the case with leprosy, HIV/AIDS, and other communicable diseases [14]. This stigma is felt, not just toward the individuals who have recuperated from COVID-19, but also toward those who are undergoing treatment and/or have been potentially exposed to the infection. Populations whose mental health is severely threatened include daily-wage laborers, clinical professionals, medical caretakers, and the police. Many of them have been driven away from their neighborhoods, denied admittance to their homes, and their families have been compromised. Their tireless efforts in trying to fight the infection have been overlooked [14]. In battling the COVID-19 pandemic, healthcare workers have been at significant risk of adverse mental health outcomes.

Dong and Bouey point out that the spread of COVID-19 could lead to a mental health crisis, especially in countries with high caseloads which require large-scale psychological crisis interventions. This is the case in India, a country that has one of the highest recorded cases of COVID-19. Anxiety is the most common health symptom faced by individuals. Anxiety is associated with impaired sleep [15]. Studies show that populations having symptoms of COVID-19 have high rates of anxiety and depression. In August 2020, Wang et al. conducted an online survey using the depression, anxiety, and stress scale (DASS-21) and reported that approximately 16.5%, 28.8%, and 8.1% of individuals exposed to infection faced moderate to severe depression, anxiety, and stress symptoms, respectively [16]. A cross-sectional, self-related survey was conducted by Li et al. through the Chinese version of the Vicarious Traumatization Scale using a mobile application. The survey showed that traumatization was higher in the general public than in non-frontline nurses and frontline nurses. And it was higher in non-frontline nurses than in frontline nurses [17]. To examine the impact of COVID-19 on the mental health of individuals in self-isolation for 14 days, Xiao et al. designed a cross-sectional, self-rated questionnaire by using the Self-rating Anxiety Scale (SAS), Stanford Acute Stress Reaction (SASR) questionnaire, Pittsburgh Sleep Quality Index (PSQI), and the Personal Social Capital Scale

(PSCS-16). The respondents to the questionnaire reported that: (1) sleep quality was positively correlated with social capital and negatively correlated with anxiety; (2) anxiety was positively correlated with stress and negatively with sleep quality and social capital [18].

Kang et al. showed that working hours, risk of infection, shortages of protective equipment, loneliness, physical fatigue, and separation from families were the main reasons that affected the mental well-being of people in Wuhan, China [19]. According to Chen et al., another significant factor was the gap between planned services at hospitals and the actual needs of healthcare workers. There is a need to set up an intervention team which would design online materials, provide psychological assistance, hotlines, and group activities for stress reduction [20]. Liu et al. point out that mental health professionals need to work especially closely with those working in critical care units to minimize stress levels and reduce the risk of depression [21]. Kang et al. observed that there was a positive impact of telephone helplines that specifically addressed the mental health problems of healthcare workers [19].

Impacts on the General Population

The general population in India has witnessed a health emergency as well as a lingering socioeconomic crisis resulting in dysfunctional processes and maladaptive lifestyle changes [22]. A study by Zandifar and Badrfam in Iran highlights that the COVID-19 pandemic, which is characterized by unpredictability, uncertainty, misinformation, and social isolation, contributes to stress. There is a need to strengthen mental health services and social capital, particularly for vulnerable populations, to reduce the adverse psychological impacts of COVID-19 [23]. Bao et al. highlight that the services provided in China included strategies for the general public to minimize outbreak-related stress. The strategies included: (1) assessment of the accuracy of information; (2) enhancing social support; (3) reducing the stigma associated with the disease; (4) maintaining as normal is a life as feasible while adhering to safety measures; and (5) using available psychosocial services, particularly those online, when needed [24]. As anxiety is the dominant emotional response to an outbreak, Lima et al. describe the need for adequate training of healthcare professionals and the optimal use of technological advances to deliver mental health care. Anxiety that arises from misinterpretation of perceived bodily sensations can be addressed in a non-pandemic period [25]. However, during an outbreak of an infectious disease, with a flood of inaccurate or exaggerated information from the media, health anxiety can become extreme. This manifests as maladaptive behaviors at an individual level and can lead to mistrust of public authorities and scapegoating of particular population groups at a broader societal level.

Influences of Media and Virtual Dependency

During a pandemic, media can add to anxiety which impacts the psychology of people. The swine flu pandemic of 2009–2010, which brought about high mortality, received worldwide media attention and evoked anxiety among the public [13]. This trend was also noticed with the COVID-19 pandemic in India. A recent online survey conducted in India showed that 28% of the population had sleeping difficulties. More than 66% said that they were stressed when they saw posts on the COVID-19 pandemic on different web-based media. Forty-six percent identified stress with conversations on the COVID-19 pandemic in news channels and print media. The study concluded that a critical number of survey respondents did not have sufficient information about the spread of the infection [26].

A survey conducted by Mavericks in India found that 61% of the people experienced mental health issues due to the lockdown because of the uncertainty of the crisis [27]. By restricting individuals within four walls, COVID-19 has prompted new ways of survival. Social distancing has pushed individuals to be able to stay connected with the outside world using digital platforms and relying on social media and video conferencing [28]. Dependence on traditional news formats including newspapers has declined. The need for instant and accurate news and the ease of accessing information online have increased reliance on online media platforms. A joint study by the Broadcast Audience Research Council of India (BARC) and Nielsen India shows a 41% rise in the time spent on news apps during the lockdown [29]. Seventy percent of respondents chose online Web sites and news aggregator apps as their sources of information. This rise was noticeable across all age groups. Google trends data showed more than a 200% rise in online searches for news during the lockdown period [30]. The impact of expanded indoor and screen time hours on mental health is, however, an under-researched area [28].

Influence of Changes in Working Environment

A large section of the population was forced to reinvent its workplace often in unfavorable environments, resulting in a deep sense of unease. In a situation entirely driven by compulsion and not by choice, working from home did not appear to be favorable to most people, and even more so to the millennials. The lockdown due to the pandemic forced all industries to get their workforce to operate remotely and to explore innovative ways to do so. In a recent survey, corporate executives indicated that working remotely will be the most significant change in the post-COVID world. Given the success of the forced experiment, many organizations are exploring options to get their workforce to work from home even after the pandemic. On the other hand, 75% of Indians find working from home very challenging and want to get back to working from the office. Most homes do not have a dedicated study room or a distraction-free area that guarantees maximum productivity. People are thus unable

to chalk out 'me time,' a designated hour carved perhaps in their commute to the office. Extended work hours and blurred lines between working and not working at home have led to a desire to return to the office as soon as possible. A survey by the Indian Psychiatric Society showed that because of uncertainties relating to issues such as finances, work pressure, job retainment, and stress in relationships, there has been a 20% rise in cases of mental illness. The number of suicides has also increased [30].

In 2013, the latest available statistics, 270 US officegoers committed suicide at work which was a 12% increase in comparison with 2012. As indicated by a stress pulse overview, unnecessary remaining tasks at hand (46%) and relationship issues (28%) are the main causes of stress at work. Most individuals who attempted suicide or succumbed to suicide had mental health problems that had not been attended to. When compared to females, male employees are many times more likely to commit suicides due to problems in the working environment [31].

While lockdown has affected numerous individuals, more than 75% of the twenty to thirty-year-olds surveyed were idealistic about getting back to work within three to four months. People above 30, however, disagreed. People who started working recently were interested to return to work. The expectation of recent college graduates to return to business is good news for the markets as they constitute the biggest shopper and spender base [30]. However, this is subject to the supposition that they have not been laid off.

Economic Insecurity and Increased Risk of Suicides and Crime

Nearly 800,000 individuals die by suicide every year globally. According to the WHO, for every suicide there are 20 suicide attempts. These numbers are bound to increase during the COVID-19 pandemic. Data from the monetary emergency of 2008 indicates that increase in suicides is related to joblessness [32]. The downsizing of the economy due to the COVID-19 pandemic has resulted in long-haul issues especially for the vulnerable at the edges of the society. It is important to set up hotlines and mental health support groups to address mental health problems. Increasing joblessness and financial misfortunes brought about by the COVID-19 pandemic have further compounded the problem [33]. As one study suggests, job losses due to COVID-19 could result in up to 9,570 more suicides globally than in a normal year [34]. Suicide rates are expected to increase after financial downturns. The US joblessness rate remains at around 14.7%. It could be nearer to 20% which means that a stunning 20.5 million individuals were jobless in April 2020. This is the largest work market decrease ever. Some financial experts caution that monetary recuperation will probably be moderate and uneven [35]. Most adults in an American Psychiatric Association study conducted in March 2020 were concerned that

the pandemic would have a genuine negative effect on their funds. Sixty-six percent dreaded that the pandemic would have a significant effect on the economy [36].

The International Labor Organization (ILO) gauges that worldwide joblessness could increase from 4.9 to 5.6%. Suicides increased by 9,570 annually before the pandemic but would increase by an additional 2,135 during the pandemic [34]. Suicides are higher among individuals who have encountered brutality, harassment, and violence. Sentiments of disconnect, sadness, stress, and other monetary burdens are known to increase the danger of self-destruction and suicide. Individuals are bound to encounter these sentiments during an emergency like a pandemic. Be that as it may, there are approaches to prevent self-destructive considerations and practices. For instance, support from the family and network and face-to-face or virtual connection can help [37]. People with substance abuse are more likely to commit suicides than the people who do not use drugs. According to an alarming report from the Centers for Disease Control and Prevention, the US suicide rates are the highest since World War II [31].

Lack of adequate and accessible support services is not the only factor that has resulted in the looming mental health crisis which remains unaddressed. Its psychological impacts are also significantly tied to the economic instabilities brought about by COVID-19 [38]. According to Shigemura et al. from Japan, the economic impact of COVID-19 influenced mental well-being, sometimes leading to high levels of fear and panic [39]. Disruptions in basic livelihoods have threatened food security and shelter, pushing people toward socially undesirable and illegal activities. In contrast, the lockdown and the restrictions imposed by the pandemic that impeded everyday actions like shopping, vacations, and gatherings resulted in fewer habitual offenders like thieves and pickpockets. A study in Sweden found that pocket-picking diminished by 61% in Stockholm during the COVID-19 period when restrictions on gatherings and crowds were imposed [40].

A survey in late March 2020 found that 90% of Americans, including basic laborers, 'remained at home as much as they could reasonably be expected to [41]'. 'Stay at home' commands caused maladjustment in the lives of billions of individuals. In the United States and around the globe, a positive side effect was a sensational drop in crime [40]. Economies around the globe were hit by lockdowns because of which financial experts anticipate an economic downturn. Joblessness will probably increase, and individuals will have less dispensable incomes to handle emergencies. Previous experience has shown that crime increases in emergency situations.

Specialists have indicated that there a rise in cybercrime since the beginning of the pandemic. For example, police authorities in Maharashtra caught 400 individuals for cybercrime. Officials also say that an increasing number of people are complaining of being cheated through online transactions [42]. The Indian government has urged citizens to be careful about phony messages and to report instances of online misrepresentation.

The Gender Factor

Due to the pandemic and the consequent lockdowns, women in India are struggling more than men as their workload has increased significantly. Women are carrying multiple responsibilities without any assistance from domestic helpers [27]. Several workers have left, and low-cost part-time help is no longer available to women. Women are reluctant to take on full-time help because it is more costly. Consequently, demand has increased for home appliances like dishwashers, vacuum cleaners, and fully programmed washing machines.

According to one survey, men experienced a greater social disconnect than women owing to forced confinement during the lockdown. However, the adverse impact on their mental health was less when compared with women because women had to cope with the additional workload at home. Women faced the possibility of higher rates of mental health problems [30].

Household stress has increased intimate partner violence [43]. The disruption of social and protective networks due to the lockdown has meant less support and protection from violence. Violence against women and girls, a human rights issue, has exacerbated during the pandemic. According to UN Women, one in every three women experience physical or sexual violence by an intimate partner worldwide. Emerging data and reports on COVID-19 have shown that all types of violence against women, particularly domestic violence, intensified. Women are placed under the increased strain of responsibilities in confined living conditions. Government authorities, women's rights activists, and civil society partners across the world are calling for help against domestic violence [44]. In China, police reports show that domestic violence tripled during the pandemic. Organizations that prevent domestic violence have observed increased household tension and domestic violence due to forced co-existence, economic stress, and fears about the virus. However, there are also examples of innovative practices to support survivors.

Increased violence against women is not only within the home, but also in other spaces. Female health workers and migrant domestic workers have faced violence. Xenophobia-related violence, harassment, and other forms of violence on online platforms have become more prevalent during the pandemic. In Delhi, for example, female students from the northeast were verbally harassed and had objects thrown at their private parts with attackers shouting '*Aye*, coronavirus!' [45]. According to the survey by UN Women in New South Wales, Australia, 40% of frontline workers including human rights defenders, women in politics, journalists, bloggers, lesbians, transgender, women belonging to ethnic minorities, indigenous women and women with disabilities reported increased requests for help as violence escalated [46]. In China, there have been reports of physical and verbal attacks against frontline healthcare workers. In Italy, the national healthcare workers union has raised concerns about attacks against doctors and nurses as COVID-19 overwhelmed health resources [45].

In Seattle, United States, there have been reports of more coercive and violent behaviors against street-based sex workers since the COVID pandemic began. In

Hong Kong, the migrant workers association warned that domestic workers, most of whom are migrant women, are being made to work on their day off [45]. The health system is under an enormous burden of COVID-19. We need a global collective effort to stop the shadow violence pandemic that is growing amidst the COVID-19 crisis. As COVID-19 cases continue to strain health services, essential services such as domestic violence shelters and helplines have reached capacity. There is an urgent need to mitigate the risk of violence against women during the pandemic. The COVID-19 pandemic has also curtailed access to support services for survivors, particularly in the health, police, and justice sectors.

Overwhelming pressure on employees and increased workload and responsibilities have imposed unimaginable lifestyle changes in women. More needs to be done to address these critical concerns. The first step should be to invest in response and recovery efforts by scaling up hotlines, crisis centers, shelters, legal aid, protection, and counseling services.

Concluding Comments

The year 2020 has been surprising in a myriad of ways. The world has lived through a pandemic where travel plans, celebrations, and social events have all been wedged. And, educational institutions, offices, entertainment spaces, and transport facilities have been shut down indefinitely. As stress, anxiety, and depression become a new part of every individual's life, mental health which were once heavily stigmatized is now recognized as a lifestyle disorder that has affected everyone. No one has been spared. Factors that have affected these changes are a lack of social interactions, changes in living and working environments, a flood of inaccurate and exaggerated information, and insecurities regarding employment and livelihoods. Research shows that mental health problems are very widespread. Mental health problems were on the rise even before the pandemic. In India, for example before the pandemic, one in seven people had experienced a mental health problem. The pandemic, however, has greatly exacerbated mental health problems.

Even though there are robust plans and interventions to strategically respond to the pandemic, there remains a need to include and actively address mental health concerns within a larger framework. In India, the Ministry of Health and Family Welfare has taken numerous steps to address COVID-induced mental health concerns through the development of guidelines prepared in collaboration with National Institute of Mental Health and Neurosciences. These guidelines are aimed at improving the resilience of populations prone to mental health problems. The Ministry of Health and Family Welfare has additionally installed helpline services in collaboration with several institutions to provide counseling, behavioral, and psychosocial assistance. Continued guidance for mental and psychosocial well-being of individuals is of high priority. A lot more needs to be done including the provision of mental health services and large-scale communication campaigns for the public to spread awareness. There is a real need to build community-based capacity to handle local issues even after

the pandemic. A team of peer counselors should work with local administrators in different parts of the country to address mental health problems.

The pandemic might be the much-needed wake-up call to make long-term adjustments to India's health system. It has provided an opportunity for India to take greater cognizance of mental health problems and to include mental health within the primary healthcare system.

Promoting job security, providing employment opportunities and economic compensation, and redressal should be some of the fundamental priorities of the government to mitigate the adverse impact of COVID-19 on the people. Leveraging public–private partnerships through existing systems and promoting cross-sectoral and multi-stakeholder engagement will be important in the COVID-19 response. COVID-19 has provided an opportunity to rethink, reinvent, and collectively readapt. The crisis has affected the very fabric of society and has placed mental health awareness on a higher level than before. As we move forward to promote solidarity and social support, the lessons learned will, no doubt, contribute to the progress of society by providing an opportunity to reflect on the ethos of individual and collective responsibility.

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Chapter 9
Malnutrition and COVID-19 in India

Shweta Khandelwal

Abstract While the world is battling the new coronavirus known as SARS-COV-2, public health and nutrition services in India are getting disrupted and derailed. It is pertinent not to overlook the existing gaps in our journey towards attaining the holistic sustainable development goals (SDGs). In fact, it is now well-established that comorbidities, especially malnutrition, diabetes, cardiovascular diseases, and other respiratory or kidney problems exacerbate the pathogenesis of COVID-19 because of an already compromised immune system. The whole world is off track in achieving SDG 2, known as Zero Hunger, by 2030. At the current pace, approximately 17 countries including India will fail to even reach low hunger by 2030. India ranks 104 out of 117 countries as per the used metric, the global hunger index. Furthermore, these projections do not account for the impact of the COVID-19 pandemic, which may worsen hunger and undernutrition in the near term and affect countries' trajectories into the future.

The author underscores the serious adverse impacts of COVID-19 on public health, nutrition, and food security in India and other low- and middle-income countries. Estimates show that 135 million persons were hungry before the pandemic. By the end of 2020, the number will likely increase to 265 million. India carries a heavy burden of multiple forms of malnutrition including undernutrition, hunger, micronutrient deficiencies as well as overweight, and obesity. India's public health and nutritional policies must urgently address these problems. Measures taken by the government during the pandemic to counter its negative impact on the nutrition of women, children, migrant labor, and other vulnerable populations are enumerated. The response of the international community to tackle COVID-19 related nutritional challenges and India's policy measures for ensuring nutrition and food security are discussed.

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Introduction

While the world is battling the new coronavirus known as SARS-CoV-2, which is expected to disrupt and derail public health and nutrition services, it is pertinent not to overlook the other existing lags in our journey toward attaining the holistic Sustainable Development Goals (SDGs) [1]. It is now well established that people with co-morbidities, especially malnourishment, diabetes, cardiovascular diseases, and respiratory or kidney problems, experience exacerbated pathogenesis of COVID-19 due to an already compromised immune response [2]. The whole world is off track in achieving SDG 2 also known as Zero Hunger. At the current pace, approximately 37 countries including India will fail to even reach low hunger by 2030. India ranks 104 out of 117 countries as per the used metric—the global hunger index [3]. Furthermore, these projections do not account for the impact of the COVID-19 pandemic, which may worsen hunger and undernutrition in the near term and affect countries' trajectories into the future [4].

While the share of undernourished people in the world has stagnated, the absolute number of undernourished people is on the rise. As of 2019, 8.9% of the world's population was undernourished, unchanged from 2018. This amounted to nearly 690 million undernourished people in 2019, up by 10 million since 2018 and by nearly 60 million since 2014 [5]. Undernutrition contributes to about 45% of deaths in children under age five [6]. India already features as one of the poorest performing countries when it comes to public health and nutrition (PHN) statistics (Table 9.1).

Although nutritional deficiencies are found in all age groups, children under five years of age are more vulnerable. The prevalence of stunting in children aged 0 to 59 months decreased from 48% in 2005–2006 to 38% in 2015–2016. Similarly, the proportion of underweight children decreased from 43 to 36% over the same time period. However, the same decade witnessed an increase in overweight populations from 1.5 to 2.3%. During this decade, the wasting rate also increased from 17 to 21%. Among non-pregnant women (15–49 years) specifically, there was a decrease in the prevalence of those underweight from 35.5% in 2005–2006 to 22.9% in 2015–2016 and an increase in obesity/overweight from 12.6% in 2005–2006 to 20.7% in 2015–2016 [7]. Micronutrient (vitamins and minerals) deficiencies, referred to as 'hidden hunger,' affect cognitive and mental development, thereby impacting productivity and overall quality of life [8]. In India, over 0.5% of the total deaths in 2016 were due to nutritional deficiencies. In 2017, the prevalence of anemia was 60% in children and 54% in women. Nutritional anemia is caused by deficiency in iron, folate, and vitamin B12. Anemia increases the risk of adverse birth outcomes, infant and maternal mortality, and results in poor cognitive and mental development in children. The introduction of various interventions for anemia control by the government has decreased its prevalence in preschool children from 74.3% in 1998–1999 to 58.5% in 2015–2016 [9].

The government launched the National Iodine Deficiency Disorder Control Program in 1992 to tackle the problem of goiter. This program focused on universal iodization of salt and imposed a ban on direct selling of non-iodized salt to consumers

Table 9.1 Nutrition indicators in India

Children < 5 years	
Percent with low birth weight	18.0
Percent stunted	38.4
Percent wasted	21.0
Percent overweight	2.0
Percent anemic	58.5
Percent less than age 6 months exclusively breastfed	54.9
Percent who initiated breastfeeding within one hour of birth	41.6
Percent aged 6–23 months receiving appropriate complementary food	9.6
Adults	
Women in reproductive age group	
Percent thin	23.0
Percent anemic	53.0
Men and women 18–65 years	
Percent men overweight or obese	18.9
Percent reproductive age women overweight or obese	20.7
Percent men obese	3.0
Percent reproductive age women obese	5.1

Source Compiled by author from various nationally representative sources

[10]. The consumption of iodized salt in households increased from 71.6% in 1998–1999 to 93.1% in 2015–2016 [11, 12].

As is evident from the nutrition card of India, it is imperative that if the nation is to become a global leader in all spheres of development, nutrition security and public health must be improved. Governments and donors must maintain nutrition as a priority, continue to support nutrition programs, and ensure the efficient use of resources (Box 1).

Impact of COVID on the Already Grim Statistics for Public Health and Nutrition

Malnutrition and COVID-19 are intrinsically linked [11]. Undernutrition can exacerbate COVID-19 pathogenesis. And obesity and diet-related non-communicable diseases are associated with more severe COVID-19 outcomes. The pandemic is also likely to result in a fall of 6–10% in the global gross domestic product (GDP), which would push more people into extreme poverty and malnutrition. COVID-19 will severely disrupt livelihoods, especially for the 1.6 billion people working in the informal economy. At the same time, the production, transportation, storage, and

sale of food have been disrupted. The crisis is threatening to erase the gains made in recent years in the SDGs related to child protection, education, health, and nutrition [13, 14].

The nutritional crisis created by the COVID-19 pandemic in low- and middle-income countries (LMICs) will have immediate and long-term consequences [4, 12]. The pandemic and the related global economic recession have caused a severe setback to the already inadequate progress made by India to achieve the global nutrition targets for stunting, wasting, maternal anemia, and breastfeeding by 2025. Food and nutrition security is threatened by the pandemic. For example, schools were shut down at various points in 2020 preventing access to nutritious meals for children. The global economic recession due to the pandemic could leave up to 80 million additional people undernourished in net food-importing countries alone [15]. For each percentage point drop in the global GDP, 700,000 additional children are expected to suffer from stunting, a symptom of chronic undernutrition. And 6.7 million children in middle-income countries will experience wasting. Nearly 1,30,000 additional child deaths associated with this spike in child wasting and pandemic-induced reductions in nutrition and health services could occur.

Box 1
Why is attention to nutrition critical?

- Malnutrition can affect the course of illness in individuals and populations.
- The pandemic and associated policy actions together will shape India's course in malnutrition in the short, medium, and long term.
- Multiple systems that affect nutrition—food, health, social, and economic situations—are being disrupted by the pandemic.
- India and the world simply cannot afford to backslide on the momentum in tackling malnutrition.
- Food and nutrition security must be safeguarded by protecting the poor and most vulnerable from hunger and malnutrition.
- Essential preventative and curative nutrition interventions must continue for child survival, health, and development.

Several reports have recently surfaced regarding the mental health of children and young adults. The National Mental Health Survey 2015–16 reported that 10% of adults meet the diagnostic criteria for a mental health condition (ranging from mood and anxiety disorders to severe mental illness) [16]. The Global Burden of Disease Study estimated that nearly 200 million people in India experienced a mental disorder and nearly half of them suffered from depressive or anxiety disorders [17]. The 'FEEL-COVID' Survey (February–March, 2020) of 1,106 participants across 64 cities reported that a third of the respondents faced significant 'psychological impact' because of COVID-19 [18].

The following are some effects of COVID-19 on public health and nutrition.

Disruption and Slowdown in National and Global Food Production and Supply Chains of Perishables

Projections show that feeding a world population of 9 billion people in 2050 would require raising overall food production by some 60% [19]. High food output achieved in the past has placed great stress on natural resources. The agriculture sector specifically is a major source of greenhouse gas (GHG) emissions. Agriculture, forestry, and associated land use changes contribute to 20 to 30% of the total anthropogenic greenhouse gas emissions. The expansion of the livestock and biofuel sectors plays a major role in deforestation and land degradation, thereby contributing to climate change. Other GHG emissions stem from fossil fuel use in the field as well as from the whole food system continuum, such as food transport, storage, cold chains, processing, and food loss and waste. Furthermore, globally about one-third of food produced for human consumption per year is lost or wasted [20]. The recommendations of the Second International Conference on Nutrition (ICN2) for sustainable food systems are presented (Box 2).

Box 2
The Second International Conference on Nutrition: Framework for action

Policy actions for developing sustainable food systems and promoting healthy diets are as follows:

- Review national policies and investments and integrate nutrition objectives into food and agriculture policy, program design, and implementation in order to enhance nutrition-sensitive agriculture, ensure food security, and promote healthy diets.
- Strengthen local food production and processing, especially for small landholders and family farmers, giving special attention to women's empowerment while recognizing that efficient and effective trade is key to achieving nutrition objectives.
- Promote the diversification of crops including underutilized traditional crops, production of fruits and vegetables, and appropriate production of animal-source products as needed, by applying sustainable food production and natural resource management practices.
- Improve storage, preservation, transport, distribution technologies, and infrastructure to reduce seasonal food insecurity and food and nutrient loss and waste.
- Establish and strengthen institutions, policies, programs, and services to enhance the resilience of the food supply in crisis-prone areas, including areas affected by climate change.

As per a recent International Food Policy Research Institute (IFPRI) analysis, India seems to be in a comfortable position for rice with a surplus of 27.1 million metric tons (MMT), wheat (53.2 MMT), onion (11.6 MMT), sugar (25.4 MMT), potato (29.5 MMT), and milk (77.8 MMT). However, some high import-dependent commodities were identified, such as edible oil and pulses for which India had a short fall due to import restrictions or trade disruptions [21]. The COVID-19 supply susceptibility index (COSSI) quantifies potential supply chain constraints that could come from labor markets (e.g., casual labor/migrants, share of agricultural workers to the total number of workers), farmers' illiquidity, and lack of infrastructure (e.g., for cold storage). COSSI for Punjab (30.2) and Maharashtra (61.4) shows that Punjab has better infrastructure and market density. Punjab transported more food grains than Maharashtra during the lockdown. Maharashtra has less irrigated area and is highly dependent on seasonal migrants for most crops, making it more susceptible to COVID-19-related disruptions. States in eastern India have high COSSI due to poor infrastructure and a low share of irrigated area. This information could help policy-makers identify the levels and drivers of susceptibility in their states.

Longer Shelf Life, Easy Availability, and Lower Price of Ultra-processed Foods (High Energy–Low Nutrient Value)

World Vision (WV) conducted rapid recovery assessments in 335 communities in nine countries including Bangladesh, Cambodia, India, Indonesia, Mongolia, Myanmar, Nepal, the Philippines, and Sri Lanka to better understand the socioeconomic impact of COVID-19 on the lives of vulnerable children in Asia. More than 60% of parents/caregivers confirmed that their livelihoods had been severely affected by the COVID-19 pandemic diminishing core assets in 32% of households (HHs). Twenty-four percent of parents and caregivers shared that there was stress on the families related to loss of income, lack of school, and change in children's behavior during quarantine [22].

Disruption of Nutrition and Social Protection Programs, Preschool Nutrition, Mid-Day Meal Programs, and Rural Employment Guarantee Scheme

India has been trying to combat the problem of child and maternal nutrition since decades through the introduction of a number of government programs like the Integrated Child Development Scheme which was started in 1975, the National Nutrition Policy in 1993, the Mid-day Meal Scheme for school going children started in 1995, the National Food Security Act 2013, and *Poshan Abhiyaan* launched in 2018. Promotion of optimal child growth and development to prevent overweight and child growth failure is addressed by the Infant and Young Child Feeding Guidelines of the government through programs such as the Integrated Child Development Scheme and the National Breastfeeding Promotion Program. Schools in India are not only places

offering education but are also a means to access meals, immunization programs, and skill development opportunities. COVID-19 caused about 192 countries to shut down schools [23]. As a result, 1.5 billion children no longer had access to education in schools; 368 million children were no longer being fed at schools, and 400 million children were no longer benefiting from school health programs such as deworming. There is evidence to show that children appear to have few direct health consequences of COVID-19. But they did not benefit from school closure. The longer marginalized children are out of school, the less likely they are to return to school, particularly girls. Being out of school is associated with increased risk of early marriage, early pregnancy, child abuse especially in girls, inappropriate child labor, poor educational attainment, and lower future earnings and career prospects. A case study showing the effects of COVID-19 on nutrition in Uttar Pradesh is presented in Box 3.

Job Loss, Family Income Threatened, and Purchasing Power Reduced

Given the precarious livelihoods of many Indians, food security, safety net policies, and program responses are urgently required. The economic shock is likely to be much more severe in India for two reasons. First, the economy was already slowing down pre-COVID-19 compounding existing problems of unemployment, low incomes, rural distress, malnutrition, and inequality. Second, India's large informal sector is particularly vulnerable. In 2017–18, out of the national total of 465 million workers, around 91% (422 million) were informal workers. Lacking regular incomes, agriculture migrants, and other informal workers were hardest hit during the lockdown period. The non-availability of migrant labor is affecting harvesting activities, particularly in the northwest of India where wheat and pulses are harvested.

Public Health and Nutrition Policy Responses to Tackle Multiple Forms of Malnutrition Especially in COVID Times

Eradication of all forms of malnutrition in developing countries like India has been a well-recognized challenge, which has become much bigger with the COVID-19 pandemic. To deal with malnutrition, the Government of India, both at the central and state levels, operationalized a range of robust and effective nutrition-related policies. State-level initiatives are tabulated in Appendix 1.

> **Box 3**
> **School meal in the time of COVID-19: Uttar Pradesh case study**
>   No. of districts 75
>   No. of blocks 880
>   No. of schools 1.67 lakh

No. of teachers 5.75 lakh
No. of children 1.81 crore
No. of cooks engaged 3.78 lakh

Mid-day meal scenario pre-COVID

Hot cooked mid-day meal (MDM) served to the students present on school days.

Mid-day meal provided to the children on each school day as per weekly menu.

Average no. of student availing MDM was 102.88 lakh per day.

Food grains for hot cooked meal:

- 100 g per child per day in class 1–5
- 150 g per child per day in class 6–8

  Cooking cost for hot cooked meal:

- Rs. 4.48 per child per day in class 1–5
- Rs. 6.71 per child per day in class 6–8
- 150 ml and 200 ml hot milk provided on every Wednesday to children in classes 1–5 and 6–8, respectively.
- One seasonal fruit provided every Monday (from state budget).

Mid-day meal scenario during COVID-19

Due to COVID-19 lockdown and summer vacations, schools were closed from 24.03.2020.

As per directions of the state government, food security allowance was provided to all 1.81 crore children enrolled in primary and upper primary schools.

Food grains provided for 76 days–7.6 kg per child in primary schools and 11.4 kg per child in upper primary schools.

Cooking cost for 76 days transferred to parents' bank account—Rs. 374/- per child in primary schools and Rs. 561/- per child in upper primary schools.

- Cooking cost since 01.04.2020 was Rs. 4.97 per child per day in primary schools and Rs. 7.45 per child per day in upper primary schools.

Core response strategies

A centralized database was created for information regarding bank account details of school children and their parents through a survey done by teachers in a mission mode.

Under the provision of the food security allowance, the following measures were undertaken:

- Transfer of cooking cost as direct benefit transfer (DBT) to the beneficiaries' bank account through schools by teachers.
- Issuance of authority ledger to the beneficiaries for the collection of food grains from *kotedar*.

An online monitoring system was developed to monitor the distribution of food grains and cooking costs. Process of confirmation through interactive voice response system (IVRS) call is underway.

1.45 lakh metric tonnes of food grains and Rs. 722 crore of cooking cost were distributed to the beneficiaries.

COVID-19 has induced a colossal nutrition crisis and has affected the momentum of almost every nutrition-related program. The pandemic has again underscored the need for strong multi-sectoral convergence among national policies for addressing the nutritional needs of vulnerable groups in society. Government ministries including the Ministry of Health and Family Welfare (MOHFW), the Ministry of Women and Child Development (MoWCD), the Ministry of Education, the Ministry of Rural Development, the Ministry of Consumer Affairs, Food and Public Distribution, and the Ministry of Social Justice and Empowerment as well as departments, particularly the Department of Food and Public Distribution and the Department of Agriculture and Farmers Welfare have instituted several measures to ensure nutrition security.

The five major nutrition-related policies and programs addressing the nutritional needs of the population during the COVID-19 pandemic are as follows:

1. **Integrated Child Development Services**

   The Integrated Child Development Services (ICDS) program was started in the year 1975 under the Ministry of Women and Child Development. Key beneficiaries of the program include children below six years, pregnant and breast-feeding women (15–44 years), and adolescent girls from low-income families. Under the ICDS, beneficiaries are entitled to services for supplementary nutrition and nutrition education. They receive complementary nutrition for 300 days in a year, which is usually provided in the form of a hot cooked meal at *anganwadi* centers (AWCs) or as take-home rations. The Government of India has invested a good amount of Rs. 21,933 crore (29.9 billion USD) and has allocated 2.19 million tonnes of rice and wheat under this program. In response to COVID-19, the funds and food allocation for ICDS were increased to Rs. 2.3 lakh crore (314.27 billion USD) with 75 million tonnes of cereals. However, to stop the spread of COVID-19, services were limited to the provision of dry rations and ready-to-eat or cooked food, which was delivered at the doorsteps of the beneficiaries and was no longer distributed at the AWCs.

2. **Mid-day Meal Scheme**

   Mid-day Meal (MDM) Scheme, one of the largest school meal programs in the world, was launched by the Ministry of Education in 1995 with the objective of improving the nutritional status and enrollment of children in

school. Children studying in primary and upper primary classes in government schools/government-aided schools and schools run by local bodies are the target beneficiaries of the program. Since it is a nationwide program, every year a budget of Rs. 160 crore (21.8 million USD) is allocated for 2.54 million tonnes of rice and wheat which is provided in the form of cooked meals to school children. The scheme faced massive challenges during the COVID-19 pandemic. However, as per the guidance of the Ministry, all states and union territories (UTs) continued to provide mid-day meals by giving a security allowance for food grains and cooking costs to meet the nutritional requirements of children eligible under the scheme. Instead of cooked food, some state governments (e.g., Maharashtra and Bihar) transferred the cost of the MDM to the accounts of upper primary and primary students, while others were provided food grains.

3. **Targeted Public Distribution System**

    In 1997, the Ministry of Consumer Affairs and the Department of Food and Public Distribution initiated the Targeted Public Distribution System (TPDS) with the aim of supplying food grains, rice, and/or wheat at specially subsidized prices (at half the cost) to poor households. Under TPDS, beneficiaries are divided into two categories: (1) households below the poverty line (BPL) who are provided 35 kgs of food grains and (2) households above the poverty line (APL) who are provided 15 kgs of food grains. This program has an annual budget of Rs. 18.9 lakh crore (2596.2 billion USD) and distributes 58 million tonnes of wheat and rice to needy families. To deal with the COVID-19 pandemic, the government launched the *Pradhan Mantri Garib Kalyan Anna Yojana* (Prime Minister's plan for well-being of the poor) in March 2020 and used the platform of TPDS to deliver free food grains (rice/wheat and pulses) at a scale of 5 kg per person and 1 kg per household, respectively, over and above their regular monthly entitlements—till November 2020.

4. **National Food Security Act**

    The enactment of the National Food Security Act (NFSA) in the year 2013 by the Ministry of Consumer Affairs, Food, and Public Distribution was a paradigm shift in the approach to food security—from welfare to a rights-based approach. This act covers 75% of the rural and 50% of the urban population. The beneficiaries under this act are entitled to receive subsidized food grains at Rs. 3 per kg for rice, Rs. 2 per kg for wheat, and Rs. 1 per kg for coarse grains for a period of three years from the date of commencement of the act. Thereafter prices were suitably linked to minimum support price (MSP) under the Targeted Public Distribution System. The act covers two-thirds of India's population. There are two categories of beneficiaries: (1) *Antyodaya Anna Yojana* (AAY) households and (2) priority households (PHH). To ensure that poor, vulnerable people do not suffer on account of the non-availability of food grains during the unprecedented time of the COVID crisis, approximately 60.7 lakh new beneficiaries were added under NFSA. They could take rations as per the *Pradhan Mantri Garib Kalyan Anna Yojna* and the *Aatma Nirbhar Bharat* package.

5. **POSHAN** *Abhiyan*

The National Nutrition Mission commonly known as *POSHAN Abhiyan*, a flagship program, was launched in March 2018, under the Ministry of Women and Child Development (MoWCD). The goal of the program is to eradicate all forms of malnutrition in India by the year 2022. The mission employs a comprehensive approach which involves mapping of various schemes that address malnutrition. It focuses on strategies and appropriate practices according to the Infant and Young Child Feeding Guidelines for food and nutrition, immunization, sanitation and hygiene, food fortification, dietary diversification, and maternal health and nutrition. The mission has an overall budget of Rs. 9,046 crore (1.2 billion USD). It allocated Rs. 950 crore (129.7 million USD) for the year 2017–18, which was increased to Rs. 3,061.30 crore (418 million USD) for 2018–19 and was further raised to Rs. 3,400 crore (464.3 million USD) for the year 2019–20. COVID-19 has weakened the health system and has impaired regular nutrition services. The services of *POSHAN Abhiyan* were also badly impacted. In an effort to bring all health and nutrition services back on track, *Poshan Maah* was celebrated in September 2020. Following the theme of identification of severe acute malnutrition (SAM) children and plantation of kitchen/nutrition gardens, *aanganwadi* workers referred 1,758 SAM children to public health centers and undertook plantation drives at 166 places. Along with these, an immunization drive was implemented. Approximately, 6,000 children were immunized. Adolescent girls and women were encouraged to have nutritious and immunity boosting foods. Activities addressing the importance of appropriate breast feeding and adequate nutrition during the first 1,000 days of life were also a part of the 2020 *Poshan Maah*.

Recognizing the importance of nutrition services, national and state-level guidelines were released by the government to resume operations in a safe manner. Appendices 1 and 2 list the recent or new initiatives which several states undertook during COVID-19 times.

The Ministry of Women and Child Development has issued operational guidance to inform states to restore essential nutrition services including supplementary nutrition, growth monitoring, counseling, and early childhood education. *Anganwadi* centers in non-containment areas are to reopen following all preventive safety measures including masking, hand-washing, sanitation, and ensuring physical distance. It is recommended that pregnant women and children under 10 years visit the centers for essential services. Persons above 65 years of age and those with co-morbidities are advised against entering *anganwadi* centers. The government responded quickly to the COVID crisis and announced a $22 billion relief package which included food and cash transfers. Several state governments announced their own support packages (Appendix 2). The central government's relief package, the *Pradhan Mantri Garib Kalyan Yojana,* aims to provide safety nets for those hit the hardest by the COVID-19 lockdown. However, the amount allocated is viewed as inadequate by several leading economists—$22 billion in spending is only 0.85% of India's GDP which is much lower than packages provided by the United States, Europe, and some Asian countries.

Experts have identified the following implementation challenges in the existing nutrition schemes of the government [24]:

- PDS coverage in urban areas is low (about 50%) which leaves out many urban poor.
- Access to adequate diets is problematic.
- There are exclusion and inclusion errors.
- The government has implemented a One Nation, One Ration Card (ONORC) program in 20 states. But in other states, PDS ration cards are neither portable across locations nor can rations be divided.
- It is important to ensure food quality and not just quantity.
- Extra grains pumped into the system are likely to depress prices which, in the long run, may affect small farmers and small businesses.

International Community Responses to COVID's Nutrition Challenge

Globally, approximately 83–132 million more people could become undernourished in 2020 depending on COVID-19 mitigation and economic recovery. The nutritional status of the most vulnerable is likely to further deteriorate due to the health and socioeconomic impacts of COVID-19. COVID-19 is expected to exacerbate all forms of malnutrition, rendering vulnerable people even more vulnerable. An additional 6.7 million (14.3%) young children will be wasted (58% or 3.9 million live in South Asia), with over 10,000 additional child deaths per month globally in 2020. The world is off track in achieving the SDG targets for hunger and malnutrition. More efforts (including mitigation of COVID-19) are needed to reach SDG targets by 2030. The International Food Policy Research Institute predicts that in 2020 an additional 140 million people will be thrown into extreme poverty (<$1.90/day). According to the World Food Program, the number of people in LMICs facing acute food insecurity will nearly double to 265 million by the end of 2020.

Dr. Shenggen Fan, Global Panel Member and Chair of the China Agricultural University opined 'The effect of the virus goes far beyond immediate health and economic impacts. We are seeing a fragmentation of food systems which could have serious long-term implications for food security, nutrition, diets, and the environment, particularly in lower income countries' [25].

The following measures for consumer protection against COVID-19 are recommended by the Global Panel on Agriculture and Food Systems and Nutrition (GLOPAN):

- Protect all consumers (rural as well as urban) against lasting damage to their health by ensuring that their immediate nutritional needs are met.
- Monitor food prices and be prepared to intervene to protect affordability of healthy diets.

- Ensure effective public messaging on the importance of consuming healthy diets during the pandemic and accompany this information with steps being taken locally to enhance access to food containing essential micronutrients.
- Actively regulate and prosecute fake claims on the safety of food products and food supplements.
- Keep trade in food commodities flowing.
- Promote an enhanced supply of nutrient-rich local foods as well as staples.
- Protect the viability of small and medium-sized businesses throughout the food chain.
- Avoid measures that cause longer-term harm to food system viability.
- Assess and monitor policies and actions in real time.
- Monitor medium-term projections closely.

The Joint UN Statement by the World Health Organization (WHO), the Food and Agricultural Organization (FAO), and the World Food Program (WFP) on nutrition in COVID-19 times provides similar recommendations. It advocates for and urges all to prioritize and promote healthy diets and avoid diets high in fat, salt, and sugar (HFSS), improve maternal infant and young child health and nutrition, manage wasting, provide micronutrient supplements, implement school feeding and nutrition programs, and undertake nutrition surveillance. It recommends mobilizing efforts to save lives and livelihoods, focusing attention on where the risk is most acute (preserving critical humanitarian food, livelihood, and nutrition assistance, expanding near-real-time food security monitoring systems, providing relief and stimulus packages) and strengthening social protection systems for nutrition to protect the vulnerable through nutrition-sensitive social protection measures, improving health care, investing in a sustainable future by supporting evidence-based resilient, green recovery measures, and transforming food systems.

Way Forward

India, the second-most populous country in the world, is currently under tremendous pressure. As the pandemic left deep scars around the globe, India was able to foresee the extent of the socioeconomic hit that would be caused by the pandemic and implemented lockdown and other measures to curtail the impact of COVID-19. While COVID-19 disrupted lives and livelihoods, thereby impacting several public health and nutrition programs, it is important to take cognizance of some of the positive aspects of this pandemic. The concept of 'Innate Immunity' received a lot of media attention which made people realize the importance of healthy diets. The concern of the public health community for the health of children was amplified with greater focuses on diet and physical activity. There were also some reports of reduction in out-of-home food consumption and take away foods—a feature which had become rampant in the last decade. People were able to join the dots between factory farming of livestock, poultry, and zoonotic diseases and so raised questions

about sustainability and the robustness of food systems [5]. It is critical that India's progress on nutrition is not derailed by the pandemic. Research, academia, development, and civil society organizations must advocate for greater political and financial commitment to public health and nutrition (PHN) in the response to COVID-19. This broadly means paying attention to two major areas:

1. **Healthy dietary patterns need fundamental food systems transformation at all levels.** Policy actions and investment are needed to reduce cost and increase affordability of healthy diets. Examples include:

   - Regulate and legislate food manufacturers on advertising and promotion of HFSS foods; support poor households to access nutrition-sensitive social protection schemes and community programs; start with where people with poor diets are (e.g., urban settlements).
   - Prioritize where people can acquire nutritious foods (informal traders/open markets/education and care facilities/community networks).
   - Focus on getting the whole food chain working (including demand), not just one part of it, to deliver to people who need it the most (producer innovations in selling nutritious foods for example, 'collection centers' and 'ambulances' in Nepal maintain markets for small farmers. Value addition (tomatoes into sauce) and selling online in Malawi; farmer 'call centers' in Bangladesh; and Agriculture Produce Market Committee Act amended in India.
   - Build on existing innovations to incentivize production, distribution, and consumption of nutritious foods over the longer term (e.g., community innovations in food access such as community kitchens in Cape Town townships; community self-organizing of food hamper deliveries in Rio favelas).
   - Limit junk food availability/advertising through a 'double duty' approach. Policy innovations for social protection such as complementary entitlements in Indonesia, Peru, and South Africa.

2. **Create an enabling environment for consumers to raise awareness and influence consumer behavior in favor of healthy diets, preferably with synergies with environmental sustainability.**

   Strategies need to focus on enhancing capacity and skills of the consumer to make informed choices, for example, by empowering consumers to make healthier food choices based on food-based dietary guidelines, through social media, public campaigns, nutrition education, school food programs, and community interventions. Another example is teaching ways to reduce food wastage in schools, workplaces, communities, and social gatherings.

The unanimously agreed upon actions to be taken and tracked immediately for ensuring nutrition security in COVID times and other such health and nutrition disasters in the future include [11]:

Safeguard and promote access to safe, nutritious, and affordable diets as a cornerstone of the response to COVID-19 by protecting food producers, processors, and retailers, discouraging trade bans, designating food markets, and keeping them functioning and safe for workers and consumers.

Invest in improving maternal and child nutrition by protecting breastfeeding and preventing the inappropriate marketing of infant formula, ensuring access to diverse, nutritious foods to children and women, and providing accurate information on infant feeding to caregivers.

Re-activate services for the early detection and treatment of child wasting while maintaining and scaling-up nutrition services including vitamin A and micronutrient supplementation for children and nutritional support for pregnant and breast-feeding women.

Maintain the provision of nutritious and safe school meals by reaching vulnerable children through home delivery, take-home rations, and cash or vouchers when schools are closed, ensuring adequate nutritional value of school meals and food packages, and avoiding the provision of unhealthy foods and beverages.

Expand social protection to safeguard access to nutritious diets and essential services for the poorest households, including access to fortified foods. And ensure that such schemes reach families with young children and pregnant and breast-feeding women.

Concluding Comments

The COVID-19 pandemic is undermining nutrition services across the world, particularly in low-and middle-income countries. The worst consequences are borne by young children. Some of the strategies to respond to COVID-19—including school closures, trade restrictions, and country lockdowns—are impacting food systems by disrupting the production, transportation, and sale of nutritious and affordable foods forcing millions of families to rely on nutrient-poor alternatives. Strained health systems and interruptions in humanitarian responses are eroding access to essential and often life-saving, nutrition services. Social protection systems in many low- and middle-income countries are overloaded as vulnerable families struggle to access food and services they need in the context of an economic downturn. The COVID-19 pandemic has increased wasting in children and other forms of child malnutrition including stunting, micronutrient deficiencies, and overweight. Measures implemented by the central and state governments to address the problems of hunger and malnutrition during the COVID-19 pandemic are discussed.

Appendix 1. Initiatives by the Central and State Governments to Ensure Food Security During COVID-19

State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
All India (central government)	36	5 kg free food grain and 1 kg *dal* to those with ration cards for three months	Supplementary nutrition rations for children under six years, and pregnant and lactating women at home or compensatory food security allowance	Rs. 1,000 for social pensioners in two installments over three months	Nothing additional		Rs. 100 per homeless person to feed three meals a day in night shelters	Rs. 1,500 in *Jan Dhan* account in two installments over three months
Jharkhand	48		Home delivery of dry rations for *anganwadi* children			Full wage payment for lockdown period for registered daily-wage workers	Free *dal bhat kendras* in every *panchayat*. Free food from existing *dal bhat kendras*	Rs. 10,000 to every village *mukhiya* to distribute to eligible families with pending applications for ration cards to provide rice at Rs. 1/*kilo* procured from local markets

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Bihar	44	One-month free ration. Rs. 1,000 per eligible ration card is to be deposited into their bank accounts	Dry rations for all *anganwandi* children	Three months advance pensions				Shelter homes for the inbound migrants at the borders. Migrants outside Bihar to receive Rs. 1,000 from Chief Minister's Relief Fund; 10 community kitchens in Delhi
Madhya Pradesh	43	Free ration for one month to BPL households	Home delivery of ready-to-eat food by self-help groups			Rs. 1,000/- one-time payment to registered workers		One time payments of Rs. 2,000/- to *Baiga, Sahariya,* and *Bhariya* families. Free food to homeless and destitute people

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Uttar Pradesh	40	Free food grains for two months in advance only to widows, old people, and handicapped pensioners. Food grains free of cost for laborers, MGNREGA cardholders, *Antyodaya* scheme and daily-wage workers				Rs. 1,000 grant to 3.5 lakh daily-wage laborers and construction workers through bank accounts		
Chhattisgarh	38	Free advance ration for two months	Dry rations for *anganwadi* children and for 40 days for school children		NREGA works to open with safety of workers agricultural laborers Rs. 7,555/ month or Rs. 352 per day	Rs. 1,000 grant to 3.5 lakh daily-wage laborers and construction workers through bank accounts	Free cooked food to caretakers of patients admitted in government hospitals. Beggars, destitute to get food packets from NGOs	Rice for migrant laborers

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Rajasthan	37	Dry ration, including 5 kg wheat, 0.5 kg oil, 0.5 kg salt, 1 kg pulse, and 1 kg rice, available to all without demanding any paper or money	Door-to-door delivery of take home rations for *anganwadi* children	Two months welfare pension in advance		One-time payment of Rs. 1,000 to 25 lakhs construction workers and registered street vendors	Urban laborers not covered under PDS, to be provided free food packets	
Maharashtra	36		Home delivery of cooked food for pregnant and lactating women and children under six years in tribal areas. Supply of eggs and bananas to weak children MDM cost to be transferred in account of students (primary and upper primary)				*Shiv Bhojan Thalis* at Rs. 5 instead of Rs. 10 but not free	Schools as shelter homes for migrants

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Karnataka	35	Two months ration to all ration cardholders to be given in advance	Supply of rice, egg, and *chikkies* (jaggery and groundnut cakes) for all working days till March 31. 100 g rice per day for the students studying in first to fifth class and 150 g rice for those studying in fifth to tenth class to be distributed with the help of gram volunteers	Rs. 1,000 per family for ration cardholders			Food packets to be provided to daily-wage workers affected by lockdown	All government and private establishments to pay full salaries for the period of lockdown to both permanent and contractual workers

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Odisha	34	Home delivery of three months advance rations for both NFSA and state ration cards. The selection and appointment process of 2,590 women SHGs in place of private fair price shops. Biometric scanning has been waived off	Dry rations, for preschool and school children and pregnant and nursing women. Eggs to be distributed on a weekly basis monitored by members of mothers and *Jaanch* committees	Home delivery of four months pension in advance to 48 lakh social security pension beneficiaries	Safety guidelines for NREGA works	Rs. 3,000/- to each registered street vendors (65,000)	Hot cooked food to around 10 lakh sick and destitute in all *panchayats*. Rs. 60 per adult per day and Rs. 45 per child per day	Financial assistance of Rs. 1,000 each to 94 lakhs households covered under PDS

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Andhra Pradesh	32	Free rations for April with 1 kg *toor dal* to be delivered to BPL ration cardholders. Rs1,000/ one-time support to all BPL ration card families	Supply of rice, egg, and *chikkies* (jaggery and groundnut cakes) for all working days till March 31. 100 g rice per day for students studying in first to fifth class and 150 g rice for those studying in fifth to tenth class will be distributed with the help of gram volunteers	Door delivery of social pensions to 58 lakhs beneficiaries including widows, elderly, and differently abled				Rice and red *gram dal* to NGOs running old age homes during lockdown period
West Bengal	32	Free rations for six months to those who get subsidized ration under PDS, maximum of 5 kg of grains per person	2 kg of rice and potato per month to be handed over to guardians					Food and shelter for migrant workers

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Haryana	29	One-month free rations to all BPL families as per their entitlements, mustard oil, and 1 kg sugar	Dry rations to school children and children registered in AWCs till these places are closed			Registered workers will receive Rs. 4,500 per month on weekly basis from March 30 as DBT. Daily wagers may register on a portal to receive Rs. 1,000 per week		Coronavirus patients would get free hospitalization in government or private hospitals

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Telangana	28	12 kg of rice per person for 14 lakhs ration cardholders and Rs. 1,500 in banks				One time income support of for ration cardholders. Full wage payments to permanent and contractual workers for lockdown period	Free hot cooked meal under *Annapurna* centers. *Akshay patra* to help in this	3,40,000 migrant workers to avail the 12 kg rice and Rs. 500 benefit
Delhi	27	Food grains free of cost and 50 percent increase in quantity for ration cardholders—7.5 kg free ration to 72 lakh beneficiaries for one month		Double pension for widows, differently abled, and elderly for March		Rs. 5,000 to 8.5 lakh wage laborers and construction workers by April 7, 2020	Free lunch and dinner for anybody approaching government-run night shelters	

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Tamil Nadu	24	All the ration cardholders to get Rs. 1,000 and free rice, *dal*, cooking oil, and sugar. Construction workers and autorickshaw drivers to get 15 kg of rice, 1 kg of *dal*, and 1 kg of cooking oil			MGNREGA workers to get a two-day special salary			
Punjab	22	Free food and medicines for the needy	Food grains for mid-day meal in sealed packets to students' homes			Immediate relief of Rs. 3,000 to each registered construction worker		Punjab police to distribute 1.5 lakh dry food packets to needy
Uttarakhand			Deposit money in student's account. *Anganwadi* rations to the doors of beneficiaries' homes					Cash transfers of Rs. 1,000 to unregistered workers in labor department

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Himachal Pradesh	21	Ration including flour and rice for two months will be given to Targeted Public Distribution System cardholders	Distribution of take home ration	First quarter social security pension to widows and differently abled will be provided in the first week of April		About 105,000 workers registered with the Building and Construction Workers Board will be provided Rs. 2,000 as one-time relief		

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State	Child stunting (percent) 2015–16	Public distribution system rations	Children's and women's nutrition	Social pensions	Employment guarantee	Registered unorganized workers	Community kitchens	Others
Kerala	**16**	Free provisions to all ration cardholders in the state. BPL cardholders would get an additional 35 kgs of rice free next month. Government would give free provision kits to those under home quarantine irrespective of their income status	Dry rations to three lakhs pregnant women and breast-feeding mothers, along with two lakhs adolescent girls and 4.75 lakhs children below the age of three in AWCs	Rs. 1,000 per family. Pension for families not covered under earlier schemes	Employment guarantee in April–May	Village employment assurance program for April and May	Subsidized meals (at Rs. 20)	

Appendix 2. New Initiatives During COVID-19

S. No.	Name of the policy/program	Year	Ministry/department	Key features
1	*Pradhan Mantri Garib Kalyan Anna Yojana*	March, 2020	Ministry of Consumer Affairs, Food and Public Distribution	For 1.7 lakh crore families belonging to BPL. The *Pradhan Mantri Garib Kalyan Anna Yojana* was implemented for a period of three months, i.e., April, May, and June 2020, so poor and vulnerable beneficiaries under National Food Security Act (NFSA) do not suffer on account of the non-availability of food grains during this unprecedented time of crisis Under this special scheme, about 81 crore NFSA beneficiaries were provided with an additional quota of free food grains (rice/wheat) at a scale of 5 kg per person per month, over and above their regular monthly entitlements
2	One Nation, One Ration Card	June, 2020	–	Enabled in many states/UTs, by 31 March 2021 the scheme will be operational all over India. All eligible ration cardholders/beneficiaries covered under the National Food Security Act to access their entitlements from anywhere in the country
3	*Aatma Nirbhar Bharat Package* (Food grain distribution to migrant workers)	May 2020		Under *Atma Nirbhar Bharat Package,* Government of India provided 8 lakh million tonnes of food grains to about 8 crore migrant laborers and needy families who were not covered under NFSA or state scheme PDS 5 kg of food grain per person distributed free of cost for the months of May and June to all migrants. The states and UTs lifted 6.39 LMT of food grains. States and UTs distributed 1,06,141 MT of food grains to 121.00 lakh beneficiaries in May and 91.29 lakh beneficiaries in June 2020

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S. No.	Name of the policy/program	Year	Ministry/department	Key features
4	FSSAI Eat Right During COVID-19: Food Hygiene, Safety and Nutrition Guidelines	July 2020	MoHFW	Dietary and lifestyle guidelines and key nutrients provided for better immunity
5	State initiatives		For migrant workers, daily-wage earners, and others	**Jharkhand**: Free *dal bhat kendras* in every *panchayat*. Free food from existing *dal bhat kendras*. Rs. 10,000 to every village *mukhiya* to distribute to eligible families with pending applications for ration cards, rice at Rs. 1/kilo procured from local markets **Madhya Pradesh**: Free food to destitute and homeless people **Chhattisgarh**: Free cooked food to caretakers of patients admitted in government hospitals. Rice for migrant workers **Maharashtra**: Community kitchens in nine schools of Mumbai. Food packets for 6,000 homeless. *Shiv Bhojan Thali* at Rs. 5 instead of Rs.10 **Karnataka**: Food packets to be provided to daily-wage workers affected by lockdown **Odisha**: Hot cooked food to around 10 lakhs sick and destitute in all p*anchayats* **Andhra Pradesh**: Rice and red gram *dal* to NGOs running old age homes during lockdown period **West Bengal**: Food for the migrant workers **Telangana**: Free hot cooked meal under *Annapurna* centers with the help of *Akshay patra* **Delhi**: Free lunch and dinner to anybody approaching government-run night shelters **Punjab**: Distributed 1.5 lakhs dry food packets to the needy **Kerala**: Subsidized meals at Rs. 20

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Chapter 10
Sexual and Reproductive Health of Adolescents and Young People in India: The Missing Links During and Beyond a Pandemic

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Abstract The authors discuss the impact of the pandemic on the sexual and reproductive health of adolescents and young people. Adolescents and young adults (AYA) are at low risk from COVID- 19, and hence, it may be assumed that their needs do not warrant immediate attention. However, it is important to understand how the pandemic may have affected their lives. Evidence from previous humanitarian disasters in India and elsewhere suggests that consequences for adolescents and young adults may be significant and multi-dimensional. The authors examine the impact (short- and long-term) of COVID on the sexual and reproductive needs and behaviors of AYA in India, particularly their intimate relationships, sexual violence, access to services, and impact on their mental health.

Programs for AYA should be responsive to their needs, feelings, and experiences and should treat them with the respect they deserve, acknowledging their potential to be part of the solution, so that their life conditions improve and the adverse impact of the pandemic is minimized. Programs must also address the needs of vulnerable AYA like migrants, those from the lesbian, gay, bisexual, transgender, and queer (LGBTQ) community, persons with special needs, HIV positive youth, and those who live in poverty. It is important to understand how gender impacts the sexual and reproductive health of AYA, particularly young girls and women, in terms of restriction of mobility, increase dependence on male partners/friends/relatives, gender-based violence, control of sexuality, and the lack of privacy and confidentiality. The responses to these needs by youth-based and youth-serving organizations and the government are summarized. Recommendations are made to address prevailing gaps from a sexual and reproductive health rights and justice perspective.

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Introduction

The COVID-19 pandemic has by now affected the entire world. It has highlighted the existing gaps in equitable development and re-emphasized, in a manner that we could not imagine, the need to assess our privileges—in terms of access to education, health, housing, food security, transportation, and how we treat the environment. The stay at home and isolation requirements have impacted our basic human needs of connection, relationships, physical proximity, and intimacy. Over the last eight months, a lot has been said and written about the impact of the pandemic on our lives. COVID's impact, however, varies depending upon one's socioeconomic position. This is crucial to note because the effect of COVID on the most vulnerable sections of society and those whose human rights are least protected is likely to be more adverse and unique.

This chapter focuses on the impact of the pandemic on adolescents and young adults (AYA) aged 10–24, in India, with reference to their sexual and reproductive health (SRH). AYA are at low risk from COVID, and hence, their needs may not seem to warrant immediate attention. However, it is important to understand how the pandemic may have affected their lives. Evidence from previous humanitarian disasters in India and elsewhere suggests that consequences for adolescents and young adults may be significant and multi-dimensional [1].

A scan of the literature available on the impact of COVID on AYA in India presents a glaring gap of evidence on how the pandemic has affected their sexual and reproductive health (SRH). Most available evidence focuses on COVID's impact on AYA's education, overall health and well-being, access to livelihoods, loss of agency, and decision-making. Literature also shows COVID's impact on AYA's reproductive health. However, this is largely limited to disruption in services due to the lockdown imposed in India on March 24, 2020, which continued for months in different forms [2].

There is a noticeable silence around sexual health of AYA during the pandemic. This is an extension of course, of the silence prevalent pre-COVID. During pre-COVID times too, access to SRH information and services for adolescents, especially unmarried adolescents in India, has always been socially stigmatized and scrutinized, resulting in limited availability and accessibility of services for sexual and reproductive health and rights (SRHR) [3]. The reasons for this silence are known—the lack of acknowledgment of AYA as sexual beings, the stigma around adolescent sexuality and pre-marital sex, particularly in relation to unmarried adolescent girls, and the association of reproductive health with marriage and child birth [4]. Not surprisingly then, there is a lack of global estimates of the pandemic's effect on AYA's SRH outcomes due to the non-availability of meta-data on the SRH needs of the young, unmarried population, an invisibility largely due to stigma around pre-marital sexual activity. In India, the absence of SRH services from 'essential' health services during COVID amplifies this undocumented need [3].

While the immediate effects of the pandemic on AYA's lives are visible in terms of impact on education, mobility, employment, and leisure, the pandemic's other possible impacts on AYA's SRH will gradually be understood. The pandemic may

have medium- and long- term impacts on AYA's basic rights and agency in terms of their health and safety [5]. It is important to note that the pandemic has put a break on many of the normative aspects of AYA's development, a period ideally marked by increased independence and peer bonding [6]. This may affect the development trajectory of AYA.

Some AYA may have been forced to enter early marriages due to the pandemic; some may have had unintended pregnancies and difficulties in accessing abortions, and some may have experienced sexual violence during this period. In addition, adolescence is also a period marked by sexual awakening within the context of lack of knowledge and guidance on sexual matters from reliable sources, which is likely to be even more limited during the pandemic. It is thus important to understand the pandemic's impact on the SRH of AYA so that timely and adequate responses may be developed and to ensure that a crucial aspect of their lives is not overlooked (Fig. 10.1).

According to the current working definition, sexual health is

> …a state of physical, emotional, mental and social well-being in relation to sexuality; it is not merely the absence of disease, dysfunction or infirmity. Sexual health requires a positive and respectful approach to sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination, and violence. For sexual health to be attained and maintained, the sexual rights of all persons must be respected, protected, and fulfilled [7].

Reproductive health (RH) implies that people are able to have a responsible, satisfying, and safe sex life and that they have the capability to have children and the freedom to decide if, when and how often to do so [8].
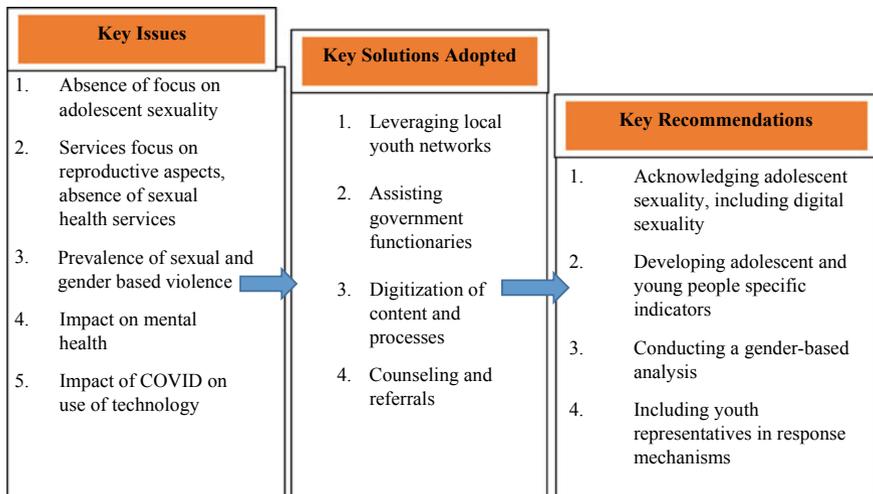
Fig. 10.1 Framework to understand the impact of COVID on adolescent and young adult's sexual and reproductive health and rights

From the above perspective, sexual and reproductive health are key factors in shaping AYA's physical and mental well-being, factors that are often overlooked in the context of a country like India. This chapter seeks to examine the impact (short- and long- term) of COVID on the SRH needs and behaviors of AYA, based on available evidence. The chapter also highlights crucial gaps in the existing evidence and builds a case for addressing them. The authors adopt the following framework in their analysis of COVID and its impact on adolescent and young adults SRHR.

Adolescents and Young People in India

As per the Census of India 2011, every fifth person in India is an adolescent (10–19 years) and every third, a young person (10–24 years). Adolescents constituted 21.7% of the total rural population and 19.2% of the total urban population in the Census in 2011. The youth population constituted about 18.9% of the total rural population and 19.7% of the population in urban areas. For the country as a whole, the percentage of male adolescents and youth is slightly higher than their female counterparts in both rural and urban areas. In 2011, the sex ratio among the adolescent population in rural areas was 901 and in urban areas was 892. In the case of the youth, the sex ratio in rural areas was 901 and in the urban areas was 910. Recently released data from the National Family Health Survey (NFHS)-5 (2019–2020) highlights that low sex ratio continues to be a major challenge in most Indian states. NFHS-5 also highlights the gender differentials across several indicators [9]. For example, the proportion of adolescent girls (15–19) who became pregnant before age 18 ranges between 10 and 15% with wide rural/urban and interstate variation. Similarly, the experience of gender-based violence (GBV) by youth (18–29) is about 4% with minor rural/urban variation. Anemia continues to be alarming among adolescents and young adult girls in comparison with their male counterparts. Child marriage rates are still high to the tune of almost 30% in some states with large interstate and rural/urban differentials.

AYA is not an homogenous group. AYA's needs vary with their age, sex, stage of development, and life circumstances—in terms of access to quality education, life skills development, place of residence (rural/urban), opportunities for collective learning and sharing, and the socioeconomic conditions of their environment.

As per the United Nations Population Fund (UNFPA), AYA in India face several development challenges, including access to quality education, gainful employment, gender inequality, child marriage, absence of youth-friendly health services, and adolescent pregnancy. These challenges have been exacerbated due to COVID [10].

A few studies, conducted during the lockdown in India, have assessed the impact of COVID on adolescents and young people in India. The Population Foundation of India (PFI) conducted a rapid assessment of the impact of COVID-19 on youth in Bihar, Rajasthan, and Uttar Pradesh [11]. Quilt Al conducted a study on the impact of COVID on adolescent reproductive health, the DASRA Adolescent Collaborative collected experiences of civil society organizations working with adolescents, and

the YP Foundation reached out to its adolescent and youth network spread across 25 states and six union territories of the country, to understand the impact of the pandemic on young lives [1, 12, 13]. Findings from these studies are representative of diverse communities of adolescents and young adults including informal laborers, gender and sexual minorities, young people belonging to different castes and tribal affiliations, sex workers, people living with HIV (PLHIV), substance users, and young people living in shelters and correctional homes.

These studies have highlighted the impact of COVID on AYA's education, access to health services including sanitary pads, iron and folic acid (IFA) tablets, contraception, abortion services, nutrition, skilling and employment assistance, and mental health services. They also provide information on how the pandemic has impacted AYA of different genders. This chapter will present the sexual and reproductive health-related findings and recommendations from these studies and will highlight data gaps that need to be addressed.

Impact of COVID on AYA's Sexual Relationships

COVID has resulted in restrictions on freedom, mobility, and socialization worldwide. This has created increased isolation. AYA have experienced increased restrictions on mobility, recreational activities, and access to support networks due to closure of schools, colleges, non-formal learning opportunities, and workplaces [1]. This has resulted in limited social engagement with their peers, guides, and mentors and in increased anxiety and loneliness [13].

Increased family time, especially in cases where AYA have been living away from home for some years, has led to greater surveillance from adults, lack of privacy, and increased likelihood of sexual abuse by family members. Personal and financial agency of adolescents and young people, especially the most vulnerable—unmarried young women, queer and trans youth, young migrants, young refugees, homeless young people, those in detention, and young people living in crowded areas such as townships or informal settlements—has been severely impeded. In a country like India where extensive parental authority is exercised over adolescents and young adults especially in the case of the unmarried, way into adulthood, one can only imagine the increase in the extent of control parents would exercise during COVID.

As said earlier, since AYA are a low-risk group for COVID, their needs are the least prioritized. It has been almost taken for granted that they would have unlimited ability to adapt to online classes, to engage in hobbies and activities to keep themselves busy, to engage with friends online and in general to stay out of adults' way, and behave as the adults would want them to.

In all the literature around AYA in the pandemic, there is hardly any reference to or discussion of how the pandemic may have affected the romantic and sexual lives of AYA. As we already know, in India, in general there is very limited to no conversation around AYA's romantic and sexual relationships and their sexual health. Therefore,

one cannot expect anything different during the pandemic, especially when COVID-related health concerns are the only ones getting priority attention. As per DASRA [1], organizations working with AYA have often struggled with obtaining information about this aspect of AYA's lives, and the constraints on meeting privately and in groups have further increased the challenge during the pandemic.

How are AYA engaging in intimate relationships during this time? How has the pandemic affected pre-marital sex, an open secret in India? Are AYA engaging in safe sex practices, keeping COVID precautions in mind? Who is providing them with this information and from where are they accessing it? Is sexual abuse a problem AYA are facing? These questions, particularly among unmarried AYA, are important but remain unanswered.

In the case of married AYA, there is evidence to show that some young married men are coercing their partners for sex, simply because the men are bored at home. The International Center for Research on Women (ICRW) and Vihara Innovation Fund's rapid qualitative study to understand the impact of COVID on the family planning needs of women and men in Uttar Pradesh (UP) and Bihar showed that for some male respondents, sex was a way of releasing their stress and a distraction from their ongoing economic crisis. Female respondents of the study reported being frustrated because of the constant demands of sex by their husbands [14]. Cases of coercive sex and domestic violence might also be increasing as a result of this situation, but systematic attention has not been paid to explore this issue.

Added to these issues is the rise of digital connections in the context of sex. As per Quilt AI, in India, COVID will catalyze the digital revolution as the base of Internet users is expected to increase from 574 to 639 million by the end of 2020. Quilt AI's study shows that more and more AYA have been spending time online, especially during the pandemic [12]. How are AYA accessing online spaces for personal connections? What about practices like online dating, sexting, virtual sex, and the associated safety-related issues? Quilt AI undertook a study to examine the impact of COVID on digital engagement on issues related to sexual and reproductive health (SRH), imparting skills to girls, and their employment. The study showed that there was an increase in searches for violent porn in towns/districts from February 2020. However, there was a gradual decline in cities. This is an important pointer toward AYA sexual behavior during the pandemic, particularly the use of online platforms for accessing porn that is violent in nature. This distinction between an increase in towns/districts and a decline in cities needs to be examined further in terms of the reasons and impact on AYA and their relationships.

It is important to recognize that the pandemic is likely to have impacted the relationships and sex lives of AYA about which little is known nor is it considered in policies and programs. Keeping in mind the social situations that might arise due to this pandemic, Banerjee and Rao explain that the probable impacts may be sexual abstinence, coercive sexual practices, non-compliance to precautions, disinterest in sex, unhealthy use of technology, interpersonal problems, rise in sexual disorders, and high-risk sexual behaviors [15]. This in turn may have impacted the already vulnerable gender dynamics, attitudes, and behaviors of AYA and their partners who may or may not be adolescents or young adults.

COVID and the Rise in Partner Violence

During COVID, adolescents and young adults, especially girls and women, may experience higher levels of violence, given the isolation and requirement to stay at home. In pre-COVID times, this population group tended to face high levels of domestic and intimate partner violence [1].

Globally, there has been increasing evidence of rising domestic violence since the lockdown, especially among women and young girls [16]. In India, it has been reported that calls seeking support against violence have been increasing since the lockdown [17]. The DASRA Adolescent Collaborative report on experiences of civil society organizations working with AYA highlights that many young people witnessed and experienced violence during the lockdown. This includes physical and sexual violence perpetrated by parents, siblings, boyfriends, and/or husbands [1]. Organizations reported to DASRA that they had been approached more often by girls in comparison with boys to report instances of physical and sexual violence [1].

Several organizations reported that many girls and young women they work with shared that their husband or boyfriend had forced them to have sex. International Council for Research on Women (ICRW) and *Vihara's* study on family planning during COVID also highlighted instances of forced sex between young married couples. In studies by DASRA and YP Foundation, AYA reported that they feel unsafe at home, indicating that they may be living with their abusers. Organizations also reported continued trafficking of girls and boys during the pandemic, and in some areas, organizations reported an increase in the number of trafficking cases.

Further, limited information is available on the violence that AYA with lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) identities may be facing. The YP Foundation highlights that LGBTQA are at increased risk of gender dysphoria, and physical and psychological violence, which is likely to be further heightened during the pandemic. A few media reports have highlighted that there has been increased discrimination against sexual minorities during the pandemic, but it is likely to be hidden in the context of India where sexual minorities are discriminated against.

As mentioned previously, AYA have been spending more time online during the lockdown. Organizations reported that more incidents of cyber bullying and use of social media to spread morphed pictures and rumors especially about girls had come to their notice. The now infamous Boys Locker Room incident from a private school in Gurgaon, Haryana, India, where male classmates created an Instagram group and were casually discussing sexual violence and rape threats against their female classmates, is one such example.

The increase in sexual and gender-based violence emphasizes the need for information and support services, response mechanisms, and access to emergency contraception and other reproductive health services. It also emphasizes the need to study the causes and impact of these increasing instances because these affect AYAs' interpersonal relationships, gender norms among them, sexual practices, and overall

mental well-being in the short as well as in the long term. Going further, this highlights the importance of finding ways to address these problems during the pandemic and ensuring that the policy and program actions have an impact post-COVID as well.

Access to Sexual and Reproductive Health Services: Growing Gap for AYA During COVID

Global media reports and research studies have highlighted that routine reproductive health services and access to supplies have been interrupted due to COVID. The majority of public health facilities in India have been converted into COVID treatment centers or have shifted their focus to managing COVID care [11]. Further, smaller clinics including private ones have been shut or have found it challenging to ensure that related precautions are in place. Diversion of infrastructure, personnel, and financial resources to COVID-related care has resulted in a shortage of supplies and other challenges in delivering health services, including reproductive health care, which was already facing challenges [11]. This has resulted in extreme difficulties, particularly for women and girls, in accessing reproductive health services, especially in the rural areas of India where they are mostly dependent on the public health system [18]. Furthermore, it has rendered any form of sexual health services, already more inaccessible than reproductive health services, more remote for young people.

Given the current situation, health services for adolescents and young adults have been generally compromised. While government guidelines specify the need to provide adolescents counseling and services through the adolescent-friendly clinics established under the *Rashtriya Kishore Swasthya Karyakram* (RKSK) scheme, these clinics have largely been non-operational during COVID. It is particularly troubling that even in pre-COVID times, adolescents reported that they found it difficult to access these clinics [13, 19].

In its study, DASRA explored the extent to which youth organizations faced challenges in accessing reproductive health and other healthcare services for the young. Findings from its report suggest that many youth-based organizations received feedback from young people about difficulties in accessing a range of services. Organizations reported that girls and boys had not received regular supplies of weekly iron and folic acid (IFA) tablets since the lockdown was imposed because these were dependent on schools and community health workers. Community health workers like accredited social health activists (ASHAs), *anganwadi* workers (AWWs), and auxiliary nurse midwives (ANMs) also confirmed this in the dialogue series organized by Women in Global Health India to amplify the voices of health workers during COVID between June–November 2020 [20].

A critical impact of COVID has been on access to sexual and reproductive health commodities and services for young people. Services like access to sanitary napkins,

routine SRHR checkups, access to contraceptives, abortion services, and pregnancy-related care for adolescents and young adults were challenging even in pre-COVID times, given India's cultural context and denial of AYA's sexuality. During the COVID pandemic, several youth-based organizations reported that these challenges have increased [1, 13].

Though young girls reported chronic shortages of sanitary napkins, their difficulties in accessing the napkins increased significantly during the lockdown. As per DASRA and YP Foundation, sexually experienced young people expressed difficulty in accessing contraceptive supplies. This may result in unintended pregnancies. Here it is important to note that there is underreporting among sexually experienced young people of unintended pregnancies. Most unmarried sexual relationships are clandestine given the social taboos and stigma associated with pre-marital sex [4]. Organizations also reported to DASRA and YP Foundation that pregnant girls had trouble in accessing ante-natal, delivery, and post-natal care when the lockdown was imposed. Some women and girls were compelled to deliver at home.

Furthermore, access to abortion services was severely impacted in general. ICRW's study in 2018 on Male Engagement in Pre-marital Abortions in New Delhi highlighted that most pre-marital abortions are clandestine and AYA rely on their informal networks to gather information on abortion services [4]. These networks may have become difficult to access during COVID.

COVID and the lockdown have had an unprecedented impact on women and girls' access to abortion. Several questions remain to be answered. What services are women and girls accessing to get abortions? Who is assisting them? How is this impacting their health and well-being? International Pregnancy Advisory Services (IPAS) estimates that in India, access to medical abortions, which is what most women and girls rely on, must have become very challenging during the lockdown and the COVID pandemic, due to lack of availability, lack of information, and lack of privacy and confidentiality. As per IPAS, 1.5 million medical abortions may have been compromised in the first three months of the lockdown period. This could be due to closure of outlets, disruption of the supply chain, and restriction in transport services, since AYA women or their partners generally avoid their neighborhood chemist shops and prefer a more distant outlet for buying medical abortion drugs due to the attached stigma [18]. Furthermore, accessing an abortion at an approved facility is challenging to begin with, particularly for abortion beyond 12 weeks. However, given the impact of COVID, as per IPAS, facility-based first or second trimester abortion may be the only option for a majority of the 1.85 million women, including adolescent girls and young adult women needing abortion services [18].

Restrictions on mobility and lack of transportation facilities during COVID-19 increased these challenges. It is important to note the unique vulnerabilities of AYA during the lockdown: limited autonomy and age-related vulnerability, wherein they are often not taken seriously, particularly in India, and the lack of adolescent-centric services to begin with may have pushed their sexual health practices and contraceptive needs further underground [3]. Also, it is crucial to recognize that data on AYA's SRHR experiences remains limited, since these are not seen as priority issues to be monitored.

While researching for this chapter, the authors noted that the limited evidence that has been collected on AYA SRHR during COVID primarily focuses on their reproductive health. Information on AYAs' sexual health and relationships remains very limited and, therefore, invisible and non-quantifiable. It is important to address this gap because we remain unaware of the impact on AYA, most of whom, anyway, lack the legitimacy or ability to openly seek SRH services.

Mental Health of AYA During COVID and Its Links to Sexual and Reproductive Health and Rights

COVID and the resulting isolation have impacted the mental health of human beings globally [21, 22]. This includes AYA more so since they are not even recognized as a group having special needs, requiring attention. DASRA's report highlights how AYA's mental health was impacted during COVID in India. AYA are facing high levels of anxiety and stress related to COVID, school closures, lack of socialization, and violence at home. Further, due to lack of opportunities to meet their peers and other adults whom they trust, AYA are unable to share their anxieties. They do not know who to approach with their questions and thoughts. Sexual and reproductive health issues are likely to rank quite high among these concerns.

Youth organizations reported that some young people had approached them with fears about their intimate relationships, sexual violence, about their future, and had shown symptoms of anxiety and depression and a few had also expressed suicidal thoughts. They talked about the impact of the lack of space at home, isolation from their friends and partners, and the lack of intimacy with their partners. While organizations refer to mental health and well-being of AYA, they do not have information on how the lack of access to SRHR services and information is impacting their mental health. The limited data suggests the need to explore further into this aspect.

The need for mental health services and counseling in general is paramount, including for adolescents and young people, who are further isolated since they do not have any avenues to share and learn from each other, leave alone accessing services and counseling. The effect of a worldwide pandemic on AYA's mental health can be devastating and cannot be overlooked [23]. The potential and lives of a whole generation of young people could be impacted.

Taking Stock of Responses to Adolescents' and Young Adults' Sexual and Reproductive Health and Rights During the Pandemic

The challenges presented above have been highlighted by youth collectives, youth-based and youth-serving organizations as seen in our review of the literature and

conversations with some of these organizations. While recognizing the impact of the pandemic on AYA's lives, these organizations also adapted their regular programs to respond to the unique needs of AYA during this time. They leveraged technology to reach AYA, trained and worked with their field staff and peer mentors to counsel adolescents remotely during the pandemic, and worked with community health workers and the public health system to address healthcare needs of adolescents.

As per DASRA, organizations leveraged digital tools like WhatsApp and Zoom, developed apps, quizzes, newsletters, and advertisements on television and radio, interactive voice response (IVR), and telephone systems to spread awareness about government-mandated information to dispel misconceptions and stigma, to learn about the feelings and experiences of AYA, and to run their SRHR programs. Some organizations adapted their sexuality education curricula to a digital mode (videos, audios, and animations) and are continuing their programs online. Organizations held creative sessions (poetry, painting, and movie screenings) to engage AYA on COVID and related issues, as well as other educational issues. Further, tele-services during the pandemic were used to provide counseling to AYA on SRHR, for example, where to access sanitary napkins and contraceptives, where young people can go for abortions, and on safe sex practices.

Organizations trained their staff to address the unique needs of AYA during this time, to connect with AYA, and understand their needs so that appropriate responses can be developed. They have also worked to provide women and girls access to sanitary napkins. Some delivered sanitary napkins to the homes of adolescent girls in rural areas and urban slums; others conducted online classes on how to make pads at home. They also helped pregnant women access ante-natal care, institutional delivery by arranging transportation, and post-natal care. They worked with community health workers to ensure that they could provide these services—IFA tablets, sanitary napkins, contraceptives, transportation for deliveries, and counseling—wherever possible. Organizations reported working with their youth leaders, peer mentors, and girl champions to reach out to AYA. For example, in the case of an unintended pregnancy, the peer mentors helped women and girls access timely abortion services.

Organizations responded to complaints of sexual violence by providing counseling through their field staff (mostly telephonic) and provided referrals to other facilities. In some cases, organizations went to the child protection committee and reported the case to the police and district or block authorities. Organizations also counseled parents about stopping early marriages, particularly of young girls, advised them to continue their education, and encouraged parents to create a space at home where adolescents could feel safe. All of these were vital before the pandemic but took on special impetus during the pandemic.

Some organizations created safe spaces to enable AYA to share their fears, anxieties, and uncertainties, both online and offline, through WhatsApp, TikTok, Instagram, and Facebook groups, and through telephonic platforms. Organizations are experimenting with online fellowship programs to build leadership and life skills. They are leveraging virtual training kits and tools developed by UNICEF and Child-Line India to check in with adolescents about their mental health. However, the

issue of equitable access remains a big challenge. Many AYA do not have access or regular access to smart phones and the Internet. This is more challenging for girls and women, especially in rural areas, because the men and boys from the household control the smart phones available at home.

While all these efforts are commendable and responsive to local needs and contexts, a key gap remains—that of addressing the sexual health of AYA. Organizations have limited understanding of the sexual relationships of AYA. The challenges that they face in gathering this information increased significantly during COVID. Another gap is the issue of appropriate and gender-disaggregated data on SRHR of AYA. Organizations have not systematically collected data on how COVID has impacted AYA's SRH. Data gathering has been sporadic and need based, which makes it difficult to capture realities accurately and to design programs to address SRH needs.

The Way Forward

The trend of not prioritizing adolescent and young adults' sexual and reproductive health has continued during COVID. The recommendations for adolescents and young adults that SRHR experts have been making over the years remain valid and even more urgent—such as acknowledging adolescent sexuality, talking about sex from the perspective of pleasure as well as safety, ensuring sex education in schools and colleges, creating safe spaces where adolescents can share their fears, anxieties, feelings, experiences, gathering information from AYA to ensure that programs for them are responsive to their unique needs, creating peer groups of AYA, and building capacities of community health workers to respond to AYAs' needs. In addition to continuing to persevere on earlier recommendations, the authors of this chapter would like to emphasize the following key recommendations.

First and foremost, the absence of young peoples' voices from COVID response mechanisms set up by the government is unfortunate. It represents a dismissal of young people's experiences and unique needs. In the task force set up by the government for COVID management, representatives from youth-based and youth-serving organizations need to be included. While the government, especially local functionaries, has benefitted from the assistance provided by youth-based organizations, their involvement in planning and developing strategies is limited and needs to be addressed.

Furthermore, while the needs of young people are deprioritized, young people from vulnerable groups—those that live in poverty, those with special needs, those from the lesbian, gay, bisexual, transgender, queer, intersex, and asexual (LGBTQIA) communities, and those that are disadvantaged because of their gender, caste, religion, and place of habitation—face greater challenges. Special focus should be given to the needs of young people from these groups, and their representatives should be a part of developing response mechanisms.

Gender is an obvious key factor in shaping young people's experiences, and yet, this often goes unacknowledged. The gendered impact of the pandemic on young people's lives, especially girls and women, needs to be central to the response. How has the pandemic fueled regressive gender norms, increased gender-based discrimination and violence against girls and women, and strengthened unequal power structures? This is a question that demands an answer because the pandemic will have long-term impacts on the lives of girls and women, especially those who have been married early, dropped out of school, experienced physical, economic, mental, and sexual violence, and been refused abortions. We cannot ignore or afford to sweep under the carpet, the long-term impact of the pandemic, in our current focus on immediate, short-term responses. For this purpose, timely and accurate data is required—data that captures the needs of various groups of AYA—unmarried and married, boys and girls, and so on—so that suitable and relevant responses can be developed.

We must adopt a human rights and social justice approach, something that is most overlooked with AYA, especially girls and women. This includes designating and planning sexual and reproductive health services for AYA, and re-allocating resources accordingly. For this, one must acknowledge adolescents' and young adults' sexuality as a reality. It is vital to integrate sexual well-being into the public health response for adolescents and young people.

Finally, COVID has shown the potential of technology in creating new opportunities for developing health content and disseminating it and delivering services. This must be extended to AYA's sexual and reproductive health, which is currently limited. Also, the rise in digital sexual practices needs to be acknowledged; we cannot continue to ignore or look down on them. On the contrary, recognizing their value and reach, we must encourage safe digital sexual practices. As mentioned above, the digital divide in access to technology needs to be accounted for while developing tech-based solutions. However, despite digital inequalities, young people are more connected today than ever before, and therefore, these channels must be leveraged to their fullest potential, maintaining necessary caution. In all our efforts, we need to be sure that we are addressing the entire gamut of SRH without overlooking sexual health, as we have unfortunately tended to do.

Young people are a key resource and network, more so during a health emergency. This resource remains largely untapped. Peer group programs are particularly vital in this area. With the right training, young people can work with the health authorities to help respond to the pandemic. A healthy and empowered young population is an investment as we look beyond the pandemic.

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Chapter 11
Family Planning in India during the COVID-19 Pandemic

Sanghamitra Singh and Poonam Muttreja

Abstract The authors discuss the profound impact of the pandemic on women's access to family planning services. They show how the interruption in the provision of reproductive health services resulted in a lack of access to contraceptives and consequent unplanned pregnancies and abortions. There was an increase in the unmet need for contraception and a decline in maternity care and immunization. This resulted in an increase in unwanted pregnancies as well as maternal mortality and morbidity.

The Population Foundation of India's analysis of the National Health Mission's Health Management Information System (HMIS) data to assess the impact of the pandemic on sexual and reproductive health services during the lockdown period (April, 2020–June, 2020) compared to the same period last year showed a 43 percent drop in injectable contraceptives, 50 percent drop in intra-uterine devices (IUDs), and 21 percent drop in oral contraceptives. The highest decrease (59%) was for Centchroman (weekly pill). There was a decline of more than 28 percent in institutional deliveries. A 27 percent decline in ante-natal check-ups (ANC) was observed.

The COVID-19 crisis sets back progress made in health services over the past decades. This was significant in the case of reproductive health programs which were adversely affected because financial and manpower resources were diverted to services for COVID-19 patients. The authors provide estimates of the impact of the non-availability of sexual and reproductive health services on women. Suggestions are offered for mitigating the impact of COVID-19 on the health system.

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Introduction

The COVID-19 pandemic has had a profound impact on women's access to essential health services. The inability of women to exercise their reproductive choice; inadequate availability of and access to family planning and reproductive health services; and regressive social norms which prevent women from accessing and negotiating contraception were problems well before the COVID-19 pandemic. These have been exacerbated during the pandemic. Consequently, women are at serious risk of death or disability during pregnancy and childbirth. Going forward, there is an urgent need to ensure an uninterrupted supply of and access to family planning and reproductive health services for women. In order to reach the last mile, it is important to build the capacities of frontline health workers, who are often the first and only point of contact with the public health system for rural women.

Access to Family Planning and Reproductive Health Services

Family planning, an important element of reproductive health, has rightly been at the heart of political and programmatic interventions in India and globally. Evidence across the globe reveals that investing in family planning is one of the most cost-effective public health measures and is a development 'best buy.' Prioritizing family planning interventions could result in manifold benefits to society including increased economic savings in government budgets and reduced expenditures on health care for households.

A study commissioned by the Population Foundation of India (PFI), titled 'Cost of Inaction in India: An Analysis of Health and Economic Implications,' estimated for the projected period 2015–2031 that if family planning interventions are implemented to their full potential, India could avert 2.9 million infant deaths and prevent 206 million unsafe abortions. Thus, if investments are increased in family planning, the Indian economy will benefit by an additional 13% increase in per capita gross domestic product (GDP). The government could save up to Rupees 270 billion (3.63 billion US dollars) and households could save up to Rupees 776 billion (10.4 billion US dollars) or 20% of their out-of-pocket health expenditure resulting from additional child births and child hospitalizations [1].

In contrast, inadequate investments in family planning would result in a loss to individuals, households, and the nation. This is particularly relevant currently as the COVID-19 pandemic has not just impacted people's health but has also seriously affected people's livelihoods and has affected the national economy.

Impact of COVID-19 on Family Planning Services

The COVID-19 pandemic and the nationwide lockdown have had a profound impact on women's access to sexual and reproductive health and family planning services. The Population Foundation of India's analysis of the National Health Mission's health management information system (HMIS) data to assess the impact of the pandemic on sexual and reproductive health services during the lockdown period (April 2020 to June 2020) compared to the same period last year (April–June 2019)[1] showed a 43% drop in injectable contraceptives, 50% drop in intrauterine devices (IUDs), and 21% drop in oral contraceptive pills (OCPs). The highest decrease (59%) was for Centchroman (weekly pill). There was a decline of more than 28% in institutional deliveries. A 27% decline in ante-natal check-ups (ANC) was observed [2].

During the pandemic, maternal and child health services were also seriously impacted. These included institutional deliveries, ante-natal care, immunization, and outreach services by anganwadi workers and accredited social health activists (ASHAs). As per the government's advisory, these services were stopped in the containment zones during the lockdown. Several regions were not visited by anganwadi workers and ASHAs after the lockdown began in March 2020. Many hospitals were converted into COVID-19 facilities, and several private nursing homes were shut down. And because of the restrictions on movement, many people including women could not visit healthcare facilities.

To assess the impact of COVID-19 on access to health services by young people, Population Foundation of India commissioned two rapid telephonic assessment surveys. The first survey included young people 15–24 years of age in three states (Bihar, Rajasthan, and Uttar Pradesh). The second survey covered frontline workers, grassroots organizations, and community members in five states (Bihar, Jharkhand, Odisha, Rajasthan, and Uttar Pradesh). The findings of these surveys showed that young people in three of India's largest states—Uttar Pradesh, Bihar, and Rajasthan— reported an unmet need for reproductive health services and sanitary pads during the lockdown period. Contraceptives were available at the district level but because of limited access to public transportation, frontline workers were not able to collect contraceptives supplies to be delivered to their clients [3].

The long-term consequences of this disruption in reproductive and maternal health services will be severe as has been witnessed in the aftermath of past epidemics like Ebola and Zika in Africa and other countries. Experiences from past epidemics show that during an emergency, resources are often diverted from routine health services and used for containing the outbreak [4].

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[1] was last accessed in November 2020

Projections of the Impact of Disruption of Essential Health Services

Recent projections suggest that as a result of the disruption in health services due to the pandemic, the following outcomes can be expected:

- Twenty-six million couples in India will have no access to contraceptives due to the lockdown in 2020 [5].
- The inability to access contraceptives during the lockdown is likely to result in an additional 2.4 million unintended pregnancies in India [6].
- Close to 2 million Indian women will not be able to access abortion services in the near term due to COVID-19.
- There will be a 10% decline in the use of reversible contraceptive methods in low- and middle-income countries (LMICs) due to poor access. This will result in an additional 49 million women with unmet need for modern contraceptives and an additional 15 million unintended pregnancies over the course of a year [7].
- Countrywide lockdowns which forced clinics to close will result in an additional 3.3 million unsafe abortions in LMICs over the course of a year [8, 9].
- COVID-19 will disrupt efforts to end child marriage which will result in an additional 13 million child marriages globally that could otherwise have been prevented [10].

Mitigating the Risk to the Family Planning Program

In the wake of the pandemic, it is important to ensure Universal Health Coverage (UHC), including universal access to family planning services. In the words of Dr. Soumya Swaminathan, Chief Scientist, World Health Organization, 'leadership and political will will play an important role in handling this pandemic [11]. COVID-19 is a grim reminder of the government's primary responsibility to ensure people's health and well-being. Investing in the public health system will make a difference to the country's response to COVID-19. It is critically important to include sexual and reproductive health and family planning services as essential components of Universal Health Coverage.'

The following interventions should be implemented to minimize risk.

Ensure Equitable Access to Essential Health Services Even During Emergency Situations

Ensuring equitable access to essential health services, including family planning, even during emergency situations is important for all, especially the most vulnerable and marginalized groups such as women, young people, and migrants. To prevent

the interruption of essential commodities, it is important to ensure that adequate contraceptive stocks are available at different levels of the public healthcare system. Systems should be put in place for forecasting the need for commodities on the basis of actual consumption so that buffer contraceptive stocks can be maintained.

Social Marketing

Social marketing organizations have been an important compliment to the government's program for ensuring an uninterrupted supply of reversible methods of contraception. Social marketing programs are centered on providing affordable access to and choice of spacing methods (condoms and pills) through commercial channels. There is a need to expand the basket of social marketing products by including newer generations of contraceptives, menstrual hygiene products, and pregnancy kits. In addition, there is a need to build more robust supply chains so that delivery time from the manufacturers and social marketing organizations can be reduced.

Self-care for Family Planning

Self-care is important for improving access and availability of contraceptives for consumers, especially women. Self-care is particularly relevant during the COVID-19 pandemic when the healthcare system is overburdened. Self-care methods of contraception like condoms, oral contraceptive pills, emergency contraceptive pills, pregnancy test kits, and sanitary pads should be made available.

Provide Family Planning Services Through Helplines and Tele-medicine

Community radios, chatbots, and mobile services have been effectively used for healthcare provision. The government should forge partnerships with non-governmental organizations (NGOs) to provide services at the time of a crisis using helplines and tele-medicines.

Strengthen the Policy Environment for Choice-Based Family Planning

The role of key stakeholders, including elected representatives and opinion leaders, in promoting and ensuring the implementation of a choice-based family planning program, is of critical importance. It is important to strategically engage with key stakeholders to create a cadre of champions who recognize the significance of choice-based family planning programs and policies and can advocate for them.

Gender Differentials in Services During the COVID-19 Pandemic

According to the UN Women's report, as of July 2020, only 11% of total global budgets for COVID-19 and data-related projects were spent on activities with explicit gender dimensions [12]. This is not surprising as even in the past, less than one percent of funds allocated for the Ebola and Zika outbreaks focused on the gender dimensions of these emergencies [13]. Going forward, it is important to generate/collate evidence which underscores the need for quality and comprehensive choice-based family planning programs. Media is an important stakeholder that can increase the visibility of family planning issues and disseminate key messages to the people.

Role of ASHAs and Other Community Health Workers

Community health workers such as ASHAs and anganwadi workers should be supported to ensure continuous access to family planning services during emergencies. Frontline workers are often the only point of contact with the public health system for rural women and represent the foundation of India's public health system. Investing time and resources for training and empowering them is, therefore, critical.

Critical Role of NGOs

It is important to support and ensure smooth operations of NGOs providing essential health services especially to women and children.

Increased Investments in Health Literacy and Social and Behavior Change Communication (SBCC)

Given that the implications of the COVID-19 pandemic are set for a long haul, it is critical to design national, state, and district-level strategies for behavior change communication. It is imperative to deal with COVID-19-related stigma and misinformation. Clear, unambiguous, contextually relevant, easy-to-understand messages should be communicated to the people through print, electronic, and social media.

Findings from the evaluation of the Population Foundation of India's flagship SBCC initiative, *Main Kuch Bhi Kar Sakti Hoon-I* (A Woman, Can Achieve Anything) showed that there was an improvement in the knowledge and awareness around family planning and contraception as a result of this initiative. In season 1 of the program, knowledge about family planning among men and women increased from 47 to 59%. In season 2, 66% of married women and 64% of the youth said that this program had provided them with information which they had not received from any other source. In season 3, women reported an increase in knowledge of modern contraceptives—especially of injectable contraceptives—for which knowledge increased by 30%.

Concluding Comments

Disasters are never gender neutral, and COVID-19 has reaffirmed this in more ways than one. Given that COVID-19 is not a stand-alone pandemic impacting the world, there is a need to build greater resilience in India's public health system. Gender-responsive policy-making and placing women at the center in all aspects of decision-making are paramount if we truly intend to move the needle on the status of women's health in India.

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Chapter 12
Gender Insights into a Unique Threat to Human Development

Check for updates

Madhu Bala Nath

Abstract Both primary and secondary data are examined to study the gender dimensions of the pandemic. While maintaining a focus on health, the author discusses the linkages of health, poverty, and women's agency. The COVID-19 pandemic has impacted the human development index that incorporates literacy, income, and life expectancy.

COVID-19 has severely impacted women's reproductive health. Unintended pregnancies, abortions, and maternal mortality have increased as a consequence of the pandemic. The demand for services, especially nutritional services, child immunizations, and family planning services was not met. Research shows that sexual and gender-based violence increased during the pandemic. Mental health problems also increased. All these problems affected women disproportionately. The impact of stigma on women's health is discussed. Its effect on LGBT communities is underscored. The suicide rate in India was higher than that in other countries in South-East Asia even before the pandemic. COVID-19 exacerbated this problem.

The author suggests that the government should support disadvantaged communities including the LGBTQ community by transferring leased assets as an eligible collateral for working capital loans. It is recommended that relief packages for COVID-19 should be reworked so they are gender responsive.

COVID-19 is threatening the gains made by India to increase women's education, livelihood opportunities, and labor-force participation. It is also affecting women's physical and mental health. The author argues for strengthening women's agency, a critical imperative for countering these problems.

Introduction

No disease in living memory has posed as a great threat to global health as COVID-19. Some scholars have remarked that it is time that we start treating this pandemic on the scale of a thermonuclear war and making investments needed in a timely

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manner so that the consequences of inattention do not harm humanity. We must not allow the unthinkable to become the inevitable.

This chapter examines the impact of COVID-19 on men and women, trans-men and trans-women, lesbians, and gays. Learning from earlier epidemics and using research-based evidence, the gender dimensions of the pandemic are presented. While maintaining a focus on health, the interlinkages of health and poverty are discussed. Within this framework, factors such as supporting women's physical and mental health and strengthening women's agency as well as that of the lesbian, gay, bisexual, transgender, and queer (LGBTQ) community in the response to COVID-19 are examined.

A forward-looking strategy that encompasses the engagement of *panchayats* to strengthen women's self-help groups at the local level is presented. The objective is to promote health by improving food security and generate livelihoods for reducing hunger and malnutrition. In addition, health and wellness centers, locally owned and managed by self-help groups, are envisaged. Health workers at the village level should be trained using functional digital literacy to respond to health-related challenges. The spirit of the recommendations is to leave a legacy wherein COVID-19 is not seen as a disaster that had to be endured but rather, understood by generations to come, as a challenge that was addressed.

An Unprecedented Pandemic

The world is experiencing an unforeseen, unprecedented pandemic of an intensity that has paled all other epidemics and pandemics. COVID-19 has taken the world by storm. The virus can mutate which makes vaccine development a challenge. Sudden and quick progression to death happens in fractured health systems and this impacts negatively on the morbidity and mortality indicators of nations. The ability of the virus to stay alive on surfaces for days and its ability to transmit infection from one person to another even with a low viral load is a challenge. These are serious challenges in resource-poor settings where infrastructure is weak. The impact of COVID-19 on health systems has been crippling. The healthcare system is dependent on the availability of functioning facilities and a robust health workforce. The lockdowns affected the erstwhile vibrant and robust economies which was devastating. Suddenly, and without any warning, countries came to a screeching halt. For a large number of Indians, the pandemic triggered an intertwined health and financial crises. Overcoming these two crises together has been challenging.

The Gendered Gains of Globalization—A Reversal

The pandemic is increasingly reversing the gains of globalization. For example, the sealing of borders by countries in the Middle East had an impact on the livelihoods

of large numbers of migrants from South Asia, including India. These migrants had benefitted from relatively better economic opportunities in these countries. A number of nurses and domestic workers lost out. The ban on the export of essential drugs to other countries by the Government of India could have a very negative impact on the health of men and women. Pharmaceutical exports were restricted for drugs such as paracetamol, antibiotics, and vitamins as well as hormonal drugs like progesterone which is used during pregnancy and for menstruation-related problems by women as well as by trans-women for gender affirming therapies. Indian drug makers rely on China for almost 70% of the active ingredients. Industry experts have forecasted that India could face shortages of drugs if the COVID-19 pandemic continues [1].

South Asians and Indians seem to be at a greater risk of COVID-19. On June 19, 2020, James Gallagher, the BBC Health and Science correspondent reported a study of COVID-19 patients in the United Kingdom which showed that people from South Asian backgrounds were 20% more likely to die from COVID-19 than white people. This research involving public health bodies, universities, and 260 hospitals was published in the Lancet. It showed that South Asians are at greater risk of dying, due at least in part to a higher prevalence of pre-existing diabetes. Out of every 1,000 white people who were admitted to hospitals for COVID-19, 290 died. For South Asians, the figure was 350 out of every 1,000.

COVID–19 Has a Gender Face—Self-perception of Risk

The right to lead a life free of disease and disability is an entitlement according to the Indian constitution. But access to health information and services has a gender face. Special efforts are needed to reach women and members of the LGBTQ community.

A study by the Population Council in Bihar and Uttar Pradesh (UP) in April 2020 sought to assess the extent to which individuals personally felt at risk of COVID-19. The study showed that although all participants were aware of COVID-19, their risk perception was very low in both Bihar and UP. Prominent reasons for low-risk perception were absence of any positive case in their neighborhood and no history of traveling outside their neighborhood. At the same time, there were misconceptions among those who perceived that they were at no/low risk. Women were more likely than men to attribute their low risk to the belief that they were young and healthy, God will protect them or the virus will not spread in hot weather [2]. Women also had less accurate information on the symptoms of the disease and preventive behaviors.

The consequences of low self-perception of risk are evident. India reported 15,712 cases by April 2020. These accounted for just 0.7% of the COVID-19 cases worldwide. In just a few months, India ranks second in the list of the worst affected countries with more than eight million people testing positive. This rings alarm bells in terms of the socioeconomic consequences of COVID-19.

Like most development issues, the causes and consequences of COVID-19 are rooted in the gender construction of sexuality. Gender differentials have impacted power relations between men and women and between trans-men and trans-women.

This social construct is a 'deprivation enhancer', and so needs to be monitored and addressed in all development interventions, including COVID-19. The World Bank has estimated that the pandemic will drive more than 12 million Indians into poverty [3]. Women and members of the LGBTQ community are likely to be over-represented as discriminatory, and patriarchal values thrive in the social fabric in India. It is important to protect employment, health, including mental health, and social security for men and women, trans-men and trans-women, and lesbians and gay communities. The Reinsurance Group of America's (RGA's) global analytics and data teams recently analyzed data from a number of countries. They observed that in most countries a greater percentage of men than women died from COVID-19 (Appendix 1).

Human Development and Gender Equality: A Reversal

The United Nations Development Programme's (UNDP's) 1990 human development report moved the global discourse on development from economic indices to other indices that capture human well-being like life expectancy, literacy, and per capita income. These indicators inform the human development index. All three indices are interrelated. Thus, high literacy and high per capita incomes result in longer life expectancy. With the COVID pandemic, there has been rising unemployment and lower per capita income along with rising numbers of deaths of young and old. COVID-19 has resulted in hunger, unmet need for health services, and lower life expectancy. As mid-day meals are no longer available to school children, child malnutrition is becoming a serious problem.

A study undertaken by the Population Council in UP and Bihar showed that because of the lockdown and ensuing economic slowdown in India, as of April 17, 2020, the finances of migrant households were likely to last for a very short time. Seventy-three percent of the migrant households reported that they had lost their jobs. Eighty-nine percent needed rations to survive, 46% needed cash, 24% needed medicines urgently, and eight percent needed cooking gas. About two percent of migrant households in Bihar and UP had lost someone close to them due to COVID-19. Return migration with relaxation in the lockdown made them highly vulnerable; 40–50% of these migrant households had no separate room to quarantine, and close to 45% had elderly people with pre-existing medical conditions living with them [4].

These findings indicate that India may suffer inter-generational poverty with long-term deprivation and dependency. This prognosis is endorsed by the empirical discourse according to which descent into poverty is associated with lifestyle changes and crises like ill health. The key causes of the declining economic and inter-generational poverty are structural factors like the loss of human and financial assets and adverse market conditions. These are usually due to the sudden onset of a long-term illness and poor access to health care, and COVID-19 has created exactly the same situation in India [5].

According to the findings of a study commissioned by the United Nations, women and children are losing more than 20% of their health and social services as a result of COVID-19. Globally, approximately 13.5 million children have missed life-saving vaccinations over the past four months. According to the annual report issued by the U.N. Secretary-General's Independent Accountability Panel for Every Woman, Every Child, Every Adolescent, some children from low-income countries may never receive these routine shots. This report shows that even before the pandemic, maternal mortality was declining at a slower annual rate than what was required to meet the Sustainable Development Goals by 2030. As a result of COVID-19, 2,95,000 women are estimated to die during or shortly after pregnancy in 2020 [6].

Marie Stopes estimates that 9.5 million vulnerable women and girls in 37 countries including India are likely to be affected [7]. According to the Guttmacher Institute, globally there is a 10% decline in the use of short- and long-acting reversible contraceptives which means an additional 49 million women with unmet need leading to 15 million unintended pregnancies. The Guttmacher Institute predicts a 10% decline in the coverage of essential pregnancy-related and newborn services which means an additional 1,68,000 newborn deaths [8].

During the pandemic, Indian authorities struggled to keep track of about 4 million pregnant women and 4.75 million newborns. In other words, 76% of pregnant women and 83% of newborns did not appear in government data sheets during a period of three months. As medical professionals/health workers and frontline workers including ASHA workers were actively fighting the virus, many pregnant women were either denied care and/or admission to the hospital. Others failed to reach the hospital on time because an ambulance was not available. An estimate by the Foundation for Reproductive Health Services, India (FRSHI), suggests that 25.63 million couples were not able to access contraceptives due to the interruption in the provision of reproductive health services during the lockdown [9].

A study undertaken by the Population Council in Bihar and UP which sought to assess the demand and supply of Reproductive and Child Health (RCH) Services found that the demand for nutrition services was the highest, followed by child immunization, and family planning services. Fifty-two percent of women wanted nutritional services; 38% wanted child immunization services; and about 28% wanted family planning services. The demand for these services was much higher in rural areas than in urban areas. Among those who wanted services, a negligible proportion received them. An important reason for this state of affairs was the inefficient and dysfunctional public health system in India. A study by the Indian Council of Medical Research (ICMR) revealed that while India accounts for 20% of the global burden of disease, it has only 6% of hospital beds and 8% share of doctors and nursing staff [10].

The 75th Round of the National Statistical Survey Organization (NSSO) in 2019 showed that there were a significant number of vulnerable people. The healthcare vulnerability index was worked out for all the states and union territories of India. There was high and medium level of vulnerability in the states of Uttar Pradesh, Bihar, Jharkhand, Madhya Pradesh, West Bengal, Arunachal Pradesh, Kerala, Rajasthan,

Gujarat, Karnataka, Telangana, Andhra Pradesh, Assam, Tripura, and Uttarakhand [11].

In India, there is one doctor for every thousand people. About 40% of the patients admitted to hospitals suffer from chronic diseases. And so, the burden of care at home is also high. It is the women who have to bear the burden as caregivers within the household and also as frontline workers. Women constitute 47.2% of all health workers and almost 89% of nurses and midwives [11]. The vulnerability index could serve as a guide as COVID-19-related responses are formulated. As of now, the various relief packages like the *Atma Nirbhar* have very little to offer women.

COVID-19 and Mental Health

Lockdowns and quarantine have the potential for creating social isolation and emotional vulnerability. There is ample evidence to show that poverty and vulnerability are interdisciplinary and complex. They intersect with other forms of social exclusion such as gender, caste, and ethnicity, disability, sexuality, and spatial disadvantage. All these factors have a bearing on mental health and are recognized as forms of emotional violence.

Domestic violence is known to increase during crises. An increase in sexual and gender-based violence was witnessed in 2014–16 with Ebola and in 2015–16 with the Zika epidemic. Violence increased with COVID-19 because of quarantine and stay-at-home measures. Women and children suffered violence at the hands of controlling men. Vulnerabilities also increased with the use of the Internet. A study by Child Rights and You showed that 9.2% of adolescents surveyed (630) in the Delhi-National Capital Region experienced cyber-bullying [12].

> Recently, in a gruesome incident in Badaun (UP), a father of five daughters allegedly ripped open the stomach of his pregnant wife one evening. The 43 years old laborer returned home in an inebriated condition and got into an argument with his wife. He then slit the stomach of his wife with a sharp-edged weapon allegedly to find out the gender of the baby. The injured woman was rushed in a serious condition by the family with the help of locals, to a hospital in Bareilly. She is now battling for life [13].

Women filed more allegations of domestic abuse during the COVID-related lockdown than had been reported over the last ten years during a comparable time period. About 32 complaints per one million women were received in Delhi. The opening up of liquor shops after May 3 increased the number of cases of domestic violence. Ghaziabad reported 291 cases of domestic violence between March 25 and May 5; the number increased to 342 cases between May 5 and May15 [14]. The number of

complaints received in June 2020 was the highest since September 2019. There were reports of 13 police apathy allegations and 100 cybercrime allegations [15].

According to a news report published in the Indian Express on April 29, 2020, the helplines run by an NGO called 'Save Indian Family' that worked on men's rights received about 68 calls a day from men experiencing violence from their spouses at home. Compared to 342 women who reported crimes of domestic violence in just 15 days from just one district of Uttar Pradesh, Ghaziabad, the numbers of men reporting violence is very small.

Mental health issues resulting from increasing violence because of COVID-related lockdowns need to be countered by media campaigns on local television channels. These campaigns should aim at building public opinion against increasing violence. Information should be provided on domestic violence, its prevalence and consequences, and penalties associated with the breach of the laws on violence.

Dr. Himabindu (aged 30 years plus) received an urgent message from a COVID hospital on March 23 Monday night asking her to come to work. Telangana had by then 22 positive cases of COVID-19. Doctors without adequate protection were under great risk and stress. What was never imagined was that a woman doctor would be stopped by police on her way to work, abused, assaulted, hauled into a police station and then made to work a 12-h-shift with bruises all over her body. The police officer snatched her phone, slapped her across the face, and called her a 'bloody bitch'. '…He grabbed my hair and dragged me into the Jeep; his fellow officers began hitting me across the thighs and legs with their batons. They groped me all over, including my private parts [16]'.

Stigma accompanies most epidemics. The real-life incidents given below highlight the human costs of stigma and discrimination. Stigma was not localized; it was reported across geographies by disempowered sections of the society such as women and members of the LGBTQ communities. As the coronavirus crisis grips the globe, the earlier consensus is being replaced with a new reality. There is less data privacy with COVID-19. 'Track and Trace' seems to be the emerging *mantra.* Tools, such as location tracking and smartphone applications, are being used to track and trace.

The impact of stigma on women's health is brought out succinctly in Neelam's case. According to news sources, Neelam, 30 years of age, breathed her last on Friday June 5, while she was in her eighth month of pregnancy. She had symptoms of COVID-19. After being turned away from hospitals in Noida, her family traveled by car around Noida and then went by ambulance to eight hospitals. All the hospitals denied her care. Neelam died in the ambulance thirteen hours later [17].

Subhadra, an ASHA worker, was attacked at home in Orissa. She said that she was abused while she was collecting data on COVID-19 cases. The ASHA worker and her family members were later rescued by her neighbors [18].

As COVID-19 cases rose in Telangana, Lacchamma, an 82-year-old woman was forced to live in an isolated makeshift shed in a field. Because she tested positive

for COVID-19, she was abandoned by her sons. Lacchamma was the mother of four sons and a daughter and was unable to move without a walker. She was found passing her days near an agricultural well in *Peechara* village of *Veleru Mandal*. When her daughter later learnt about her condition and the inhuman behavior of her brothers, she rushed to the village to take care of her ailing mother [19].

A transgender shared the experience of severe violence that she faced during the lockdown period. She got married to a boy, and everything was alright for as long as she provided him with the money that she earned. But soon after the lockdown, her income stopped, and the violence started. She was beaten, sexually abused, and harassed. He took all her money and documents and abandoned her. She went to the police station to register a case, but the police did not help her due to her transgender identity (personal interview).

A peer counselor affiliated with Delhi's *Nazariya*, an NGO, who preferred to remain anonymous, reported that people from the LGBTQ community were at a very high risk of domestic violence. 'Many of the cases that we dealt with came from their native families because queer people stay with their parents, where they are continuously policed, beaten, and verbally assaulted', he explained [20].

The collage of incidents given above highlights that there has been an increase in violence because of the COVID-19 pandemic. This is across the board and includes uneducated women, working women professionals, and some men. Violence takes place not only at home but also in public spaces. The perpetrators of violence are not just illiterate men but men from the enforcement agencies of the government. The impact of violence on women's health has been well documented but the poser that arises here is—Are women in these circumstances able to access help?

A survey was conducted in May 2020 by the Suicide Prevention in India Foundation (SPIF). About 65% of 159 mental health professionals surveyed reported an increase in self-harm among their patients. More than 85% of the therapists surveyed said they were experiencing caregiver fatigue, and over 75% said that fatigue had impacted their work. Another survey in April 2020 by the Indian Psychiatric Society showed that of 1,685 respondents, 40% suffered from common mental health disorders such as anxiety and depression. The lockdown may have eased, but the situation was not improving. There was anxiety because of uncertainty about when normalcy would return. Mental health problems, including suicide, were increasing even before the pandemic. And the health system to address these problems was inadequate. COVID-19 has exacerbated the problem. The system in place is being stretched to its limits. Thus, the demand for mental health services has increased, but there is very inadequate supply of services as reported by the Suicide Prevention India Foundation (SPIF) [21].

Research by UN Women During the Pandemic

Between July and October 7, 2020, research undertaken by UN Women on the socioeconomic impact of COVID-19 underscored, in clear numerical terms, the speed and

intensity of the depletion of human capital [22]. The key areas of this empirical enquiry were a gender analysis of the impact of the pandemic on people's lives and livelihoods and consequent food insecurity, health insecurity, well-being, and empowerment. The respondents represented the religious, social, and cultural mosaic of the population. Representative samples were selected from ten million plus people in cities as well as some rural areas from 14 states. Although the focus of research was to access the impact of COVID on women's lives, its impact on the lives of men and on the lives of the members of the LGBTQ community was also studied. A total of 1221 persons were surveyed. These included 210 men, 970 women, and 41 members from the LGBTQ community. This empirical research explored the impact of COVID-19 on their health and well-being. Its key findings are discussed below:

Health and Livelihoods

The study showed that there was a huge drop in the number of female workers from 65% pre-lockdown to 36% post-lockdown. The biggest drop was in the LGBTQ community—from 87% pre-lockdown to 15% post-lockdown. The figures for men were 88% pre-lockdown and 61% post-lockdown. These findings clearly point to the need of focusing interventions on those who are most affected—women and the LGBTQ communities. The same pattern emerged when the earnings of casual laborers were analyzed. Sixty-three percent women and 75% of the LGBTQ community had no earnings post the lockdown. The figure for men was 46%. Among the salaried employees, women (39%), the LGBTQ community (75%), and men (15%) were looking for jobs after the lockdown was lifted. Eighty-six percent of the LGBTQ community had no work post-lockdown. It should be noted that all three groups, men, women, and LGBTQ community members had enough money to last them for one month only. Their survival was clearly at stake. Most were entering a state of indebtedness. Only 32% seemed to be in a position to pay off their loans.

Food consumption by men, women as well as by the members of the LGBTQ community had decreased after the lockdown. The LGBTQ community was the hardest hit. More women than men consumed less food than they had consumed before the lockdown. Sixty-four percent of the respondents had to curtail several food items in their diets. Men, women, and the LGBTQ community members were similarly impacted in this area. And so the health and nutrition of families and households living in deprivation was affected.

Disease Prevention and Treatment

This research showed that knowledge about COVID-19 and its prevention was high among men, women, and the LGBTQ community. Thus, the information campaigns undertaken by the Government of India and NGOs seemed to have been successful.

People had information on wearing masks, washing hands, not going out unnecessarily, and maintaining social distance. However, they did not know how to translate this knowledge into behaviors for prevention and care. This was because although 44% of the respondents lived in *pucca* houses and 34% in semi-*pucca* ones, 48% had to use shared toilets outside their homes, and 39% had no water supply. A number of these individuals were living with ailing senior citizens, pregnant women with newborns and infants in small premises. This shows that COVID-19 is not just a health issue. It is a structural issue. And, therefore, there are several challenges that need to be addressed. The situation of the LGBTQ community was worse in terms of infrastructure as 48% were living in very small spaces.

Very few of the respondents had undergone a COVID test. Only three positive cases had been diagnosed—one each among the 29 women, ten men, and four members of the LGBTQ community who had been tested. Regarding care of ailing senior citizens, in 88% cases, care was being provided by women and girls and only 12% by men. The study revealed that access to emergency health care was minimal. Only 23% of the women had been visited by an ASHA worker since the pandemic began. And only 58% of the women had access to medicines when they needed them. A mere six percent of the women who needed contraceptives had been able to obtain them. Vaccination was available to 41% of the pregnant women. Only 25% of infants got their regular vaccinations. As many as 30% of the respondents had no knowledge about the availability of healthcare services.

Violence and Mental Health

The UN Women study did not confirm the findings of the literature review regarding an increase in the reporting of violence by women. Although 42% of the women had information about the helplines that had been set up for reporting abuse, only 3% used these helplines. Another 3% had filed a first information report (FIR) with the police. Eighty-four percent of the respondents did not report domestic violence. Only 10% of the women reported that they were facing violence in their homes. Of these, 51% were facing emotional violence, 47% were facing physical violence, and 2% sexual violence. The focus group discussions (FGDs) confirmed that women had difficulty in reporting violence as they were under watch all the time by their abusers. Some women reported violence when the abusers were not within earshot. This state of affairs is indicative of the reality that women need safe spaces even to report violence. Safe spaces need to be created as an integral part of the COVID-19 response. The repercussions of violence on mental health could be serious if there is no enabling environment for reporting violence. The study showed that violence was on a rise but was not being reported.

Seventy-five percent of the respondents believed that the underlying reason for increase in violence was hunger. Twenty-five percent believed that the increase in domestic violence was because of excessive drinking by their husbands who had no jobs to report to. Because alcohol was not available during the lockdown, men

became violent. According to the women, 71% of the perpetrators of violence were men, and 29% were women.

Violence against the LGBTQ community increased on several fronts—landlords, neighbors, and even their own family members perpetuated violence. Some shared that the behaviors of family members changed after their incomes stopped. They were not given proper food and care as before. The LGBT community was accused of spreading the disease which had led to an increase in neighborhood violence.

Child Abuse and Child Marriage

The research showed that parents were willing to take their children to their workplace to earn extra money during these difficult times. Child begging had increased. Women were taking their kids along for begging to get public sympathy. Children were being used to sell addictive substances and were, therefore, exposed to drugs as well as to the coronavirus.

Cases of child marriage increased because of a government order which permitted only 20 people to be present at weddings. People felt that they would not have the resources to feed the entire village if they postponed their daughter's marriage. Therefore, they wanted to marry off their daughters as early as possible—while the government order was still in force. Cases of elopement also increased because girls were running away from forced marriages.

COVID-19 and the LGBTQ Community

The LGBTQ community lives under the same patriarchal system as other women. Though their experiences may differ, many of their needs overlap. And their problems require the same solutions. Stonewall's research shows that one in four lesbians and bisexual women experience domestic abuse in their relationship. Almost half (49%) of all gay and bisexual men had experienced at least one incident of domestic abuse from a family member or partner since the age of 16 [23].

The United Nations made a call for all states to assess the impact of COVID-19 on lesbian, gay, bisexual, transgender, and gender diverse persons when designing, implementing, and evaluating measures to combat the COVID-19 pandemic as violence may disproportionately affect LGBT communities [24]. National health organizations have warned that some members of the LGBTQ community may be particularly vulnerable to the effects of the disease. The reasons for increased risk include higher rates of cancer, HIV, and smoking, as well as discrimination in health care. There are also concerns about reduced support for LGBTQ members, particularly for those living in unsafe family environments [25].

Transgender may be able to conceive even while taking testosterone. The intra-uterine device (IUD) and other non-hormonal methods are good contraceptive options

for those who are on testosterone. In one study, 88% of trans-men reported using no protection. Pregnancy appeared to be desired in some trans-men; 68% had a planned pregnancy, while in 32% cases, pregnancy was unplanned. Bisexual adolescents have higher rates of unplanned pregnancy than their heterosexual peers [23].

LGBTQ communities in India are experiencing the winds of change. In October 2015, the Lucknow bench of the Allahabad high court directed the Uttar Pradesh Government and the State Election Commission to provide for inclusion of the third gender in documents including nomination papers. This followed a judgment by the division bench of the chief justice, D Y Chandrachud and justice Shree Narain Shukla who gave the order on a public interest litigation (PIL) for providing a column for the third/transgender in forms for the *panchayat* elections in Uttar Pradesh. In Pune on October 18, 2017, Dnyaneshwar Kamble, 40 years of age, was elected as Maharashtra's first-ever transgender *sarpanch*. These positive changes have been kept in mind as the following recommendations are made.

Need to Orchestrate a Multi-stakeholder Response

As women toil as producers and carers, they have a precarious existence. The threat of sudden dispossession is ever present in their lives. This is often associated with structural factors which get accentuated by unforeseen events like the COVID-19 pandemic. There are strong arguments in favor of increasing women's knowledge on health care including mental health and in strengthening women's agency.

Institutions of local governance are needed for creating a poverty buffer for women and the LGBTQ community. Due to the lack of health security and depleting financial resources of those infected and affected, a grave situation has resulted which has led to hunger, starvation, and food insecurity. This should be addressed by transferring assets in the form of common property resources to deprived communities including women and the LGBTQ community. In rural areas, key asks include a recognition of leased assets as eligible collateral for working capital loans usually provided through government schemes such as *Atma Nirbhar* which provide initial activation capital.

Relief packages for COVID-19 prepared by the Government of India need to be reworked in terms of their gender responsiveness. The experience of unpaid work in the area of health care by women in their homes or by ASHAs in the health delivery system has not been a rewarding experience. The COVID-19 pandemic offers an opportunity to correct this aberration by making these paid services. Local government resources could be pooled to create dedicated premises that can serve as low-cost, no-frills community health and wellness centers especially in locales where the government primary health center is more than five kilometers away. This will not only enhance the much-needed health infrastructure in rural areas, but will also promote community participation in infection prevention and will reduce stigma and discrimination. A partnership approach between the *panchayats*, local NGOs, women's SHGs, and representatives of the LGBTQ is recommended. It is imperative that the medical insurance packages provided by the government under *Ayushman*

Bharat to men and women should cover the running costs of the newly set up health and wellness centers. Insurance companies should finance the costs of the medical services and of the much-needed human resources.

The challenges of weak primary health centers (PHCs) in India are being increasingly recognized and acknowledged. The National Health Policy, 2017 recommended strengthening the PHC system by investing more funds. There will be an increase in overall government funding for health to 2.5% of the gross domestic product (GDP) by 2025, against 1.18% in 2015–16 [26]. Following on the National Health Policy 2017, the Government in India announced the *Ayushman Bharat* Program in February 2018. This program has two components: (1) health and wellness centers (HWCs) to strengthen and deliver comprehensive primary healthcare services; and (2) the *Pradhan Mantri Jan Arogya Yojana* for secondary- and tertiary-level care for the bottom 40% families.

Health and wellness centers would address the existing challenges in the PHC system. But their effectiveness will depend on the translation of policy to implementation with the engagement of communities, civil society, and other stakeholders. There is a need to shift services from a 'doctor-centric' to a 'team-based' approach with the involvement of mid-level healthcare providers with limited prescription rights. This approach has been given legal status by its inclusion in the National Medical Commission (NMC) Act, 2019 [27].

Strengthening Women's Agency: Including LGBTQ Community

The COVID-19 Task Force does not have gender parity for providing a gendered response to this unprecedented pandemic. The COVID-19 Task Force has two women and 14 men; a mere 14.3% of its members are women. A ground swell to push for a gendered approach is needed. The multiple stakeholder response discussed above to create a strong women's agency would help to address the challenges of this unprecedented pandemic. Why is an expanded and strong women's agency needed to stall the gendered impact of this pandemic? The examples given below are self-explanatory and provide the evidence.

During the economic crisis in 2009, more than 13 million people lost their jobs because of the slowing economy and the drastically reduced expenditures on social services. Health care moved from being an entitlement to a service that needed to be purchased. With no purchasing power in the hands of the people, the burden was borne by women. Women came to the rescue by subsidizing care costs by their unpaid labor. Thus, they saved the countries from falling into inter-generational poverty.

The learnings from the HIV/AIDS epidemic were no different. When sickness depleted social capital within communities, again women came to the forefront to replenish social capital by taking on the added burden of caring for the sick. In African countries where the problem of HIV was very severe and health infrastructure was

inadequate, women caregivers in the community responded. A large number of young girls, who had to be taken out of school, became caregivers. There are documented examples of how husbands ran away from their homes in order to avoid the burden of caregiving. In this situation, women experienced a negative economic shock, as some researchers put it. Negative economic shock indicates that household income is reduced to very low levels in a short time span.

But amidst these dark statistics there was a ray of home. The grip of the HIV virus pulled Zimbabwe away from development and prosperity. All indicators such as life expectancy, child mortality, per capita income, and literacy were on a decline. But in spite of this, the country made progress on the human poverty index. The human poverty index (HPI) provides an aggregated measure of the prevalence of poverty in a community. The HPI draws attention to deprivation in three elements, namely longevity, knowledge, and a decent and healthy standard of living. The human development report of 1999 showed that because of HIV, 50% of the population was income poor. But going by this indicator, only 25% of Zimbabweans were experiencing poverty [27].

Today, businesses are rapidly adopting flexible work arrangements, which are likely to continue. Could working from home be empowering for some women? Could this be an opportunity for equalizing gender relations? With schools and day care centers closing, many fathers have had to take primary responsibility for childcare. Could this erode social norms leading to a lopsided division of labor that burdens women? Could women, if trained well as caregivers, become the much-needed resource as India is expanding its health infrastructure? Is this an opportunity to get the 3Cs (cooking, caring, and cleaning) counted as work?

Concluding Comments

Over the last three decades, women in India have achieved greater control over their fertility. Life expectancy has increased. Women have more opportunities for education and employment. Economic growth and expansion of the service sector which employs large numbers of women will be important in supporting women to avail of the development gains. Before the pandemic in countries like India, where they were no pension plans, women remained economically active even after the age of 50. COVID-19 is threating these gains. It is affecting the physical and mental health of women and other deprived sections of society. Preserving human capital is, therefore, a priority. Timely investments should be made to develop enabling strategies. Women leadership should be strengthened using modern technologies for providing functional digital literacy. Strengthening women's agency is a critical imperative.

Appendix 1. Number of Confirmed Cases, Number of Deaths, and Percent Male Deaths by Country

Country	Total number of confirmed cases	Confirmed cases (% male)	Total number of deaths	Deaths (% male)	Date reported
U.S	2,239,121	NA	103,337	54	Jun 17, 2020
Peru	257,447	58	8,223	71	Jun 22, 2020
Spain	248,335	43	20,527	57	May 21, 2020
Italy	238,050	46	33,209	58	Jun 16, 2020
England	228,742	43	37,664	57	Jun 17, 2020
Germany	190,431	48	8,880	55	Jun 22, 2020
Mexico	185,122	55	22,584	66	Jun 22, 2020
Pakistan	185,034	74	3,695	71	Jun 22, 2020
Bangladesh	115,786	71	1,502	77	Jun 23, 2020
South Africa	105,308	43	2,100	52	Jun 23, 2020
Canada	101,276	44	8,412	46	Jun 23, 2020
Sweden	60,837	41	5,161	55	Jun 23, 2020
Belgium	60,567	37	7,016	51	Jun 19, 2020
China	55,924	51	2,114	64	Feb 28, 2020
Netherlands	49,631	38	6,095	55	Jun 23, 2020
Indonesia	47,896	53	2,535	61	Jun 23, 2020
Argentina	42,785	51	1,016	57	Jun 22, 2020
Columbia	40,719	55	1,308	61	Jun 08, 2020

Source Reinsurance Group of America (RGA), 2020

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Chapter 13
Financing for a Resilient Health System in India: Lessons from the COVID Pandemic

Indrani Gupta

Abstract COVID-19 has again brought into focus the need for building a resilient health system which can cater efficiently and equitably to the population during normal times as well as during unforeseen events like an epidemic, pandemic, or other unanticipated occurrences that impact human health. To be prepared well in advance means to avoid unnecessary morbidity and mortality on the one hand, and minimize socio-economic impact on individuals and households, on the other. The author argues that each component that goes into building a resilient health system requires financing, making health financing the key policy knob for the government. India has had to struggle in real time to fill the various gaps in the health system during the pandemic, by undertaking emergency investment on a variety of essential goods and services for the health sector. The analysis of trends in health financing indicates that government investment has remained very low which has prevented strengthening key areas of the health system like infrastructure, personnel, and medical supplies. It has also resulted in high out-of-pocket expenditures for health care by households, exacerbating inequalities in access. Finally, the latest budget outlays for health are examined to analyze whether India has been able to use the pandemic as a wake-up call for prioritizing the health sector and build a stronger health system.

Introduction

The unprecedented and unanticipated scale of the COVID-19 pandemic and the devastation it has caused has meant that countries have had to respond swiftly and efficiently to ward off economic, medical, and social crises of varying dimensions. Demographics, social and economic conditions, as well as the less-understood immunity factors combined with country-level policies around prevention and treatment determined to a large extent the rate of transmission, the magnitude of infection, and morbidity and mortality from COVID-19. While the world continues to battle

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COVID-19 and its impact on economies and societies, the question confronting countries is how to minimize the costs of illness and deaths and the overall impact of the pandemic.

The massive social and economic disruptions triggered by the pandemic required governments to undertake a series of measures to avoid the larger humanitarian crisis faced by countries in the wake of COVID-19. These have, in turn, depended on the economic health of the country and on the fiscal and monetary measures implemented to ease the financial situation for an adequate COVID-19 response [1].

Country-level health sector capacity has remained a key variable that has determined the extent to which countries have been able to cope with the impact of the pandemic, especially excess morbidity and mortality [2]. The need for governments to quickly mobilize enough resources for essential activities like testing, protective gear, and hospital bed availability has, therefore, been equally important. The ability of a country's health sector to respond efficiently or its resilience in turn is determined by the cumulative investments that have been made over time to make the sector reasonably shock-proof. Even developed countries have been overwhelmed by the caseload on their health sectors and have highlighted the need to strengthen healthcare systems [3]. There are examples of how epidemics extracted a huge toll in countries that were ill-equipped to deal with even routine care [4]. While some argue that the pandemic requires the world to reimagine the dysfunctional system of global health, the same can be said about countries as well [5]. Many countries have recognized the gaps and weaknesses in their health systems during the pandemic and the benefits of strengthening their health systems so that costs are minimized the next time there is such a crisis.

Whether it is to build a resilient health system or to respond on an emergency footing to crises such as a pandemic, health finances have remained the fundamental policy tool of governments and development agencies [6]. A resilient health system has been described as one that is vigilant, responsive, flexible and adaptive, equitable and community-centric [1]. Adequate financing is necessary to move the health system toward a resilient one—a system that can cater to people under normal circumstances and respond equally well to emergencies.

Clearly, the impact of COVID on economics and societies will be felt over many years, and it is, therefore, important to analyze, reflect on, and understand the key lessons learnt, for now and later [7].

In this chapter, we examine the Indian health system and its financing using the lens of a crisis like the COVID-19 pandemic, point out the possible reasons for the way the country responded, the steps that were taken subsequently, including in the new budget, and conclude by discussing prognosis and prospects.

Responding to COVID in India and Health Sector Preparedness

The first confirmed case was detected in Kerala toward the end of January 2020 [8]. By January 12, 2021, India had a cumulative caseload of 10.5 million cases and 151,000 deaths. Though India still has the second highest cases of COVID-19 globally, belying expectations, India has also one of the lowest mortality rates. While a much higher burden of illness and death was anticipated halfway through the year 2020, it has been extremely serendipitous that India could avoid the very high burden of deaths witnessed by developed countries. Currently, official data shows that many states in India are experiencing a slowdown in new cases as well as in additional deaths. While some of this could be due to low testing, there is yet to be conclusive evidence on other reasons such as differential immunity that could explain these trends.

That testing remains low compared to other countries is a fact. Figure 13.1 indicates new tests per 1000 for selected countries with high total burden of COVID-19 cases sourced from the database Our World in data [9]. While India did manage to increase tests quite rapidly, it happened several months after the first case, around June 2020, and testing levels never reached the levels of these countries. New tests per 1000 remained low in India.

This is better understood from Fig. 13.2 which shows new cases smoothed per million and new tests smoothed per 100,000. The figure shows that tests had been slow to increase till about June and increased to a peak around October, but since then the tests have declined somewhat. New cases have been coming down from October but so have been the tests. There always remains a possibility that had new tests increased at a rate similar to the earlier months, more cases would have been detected. However, it is certainly heartening to see the gap widening between
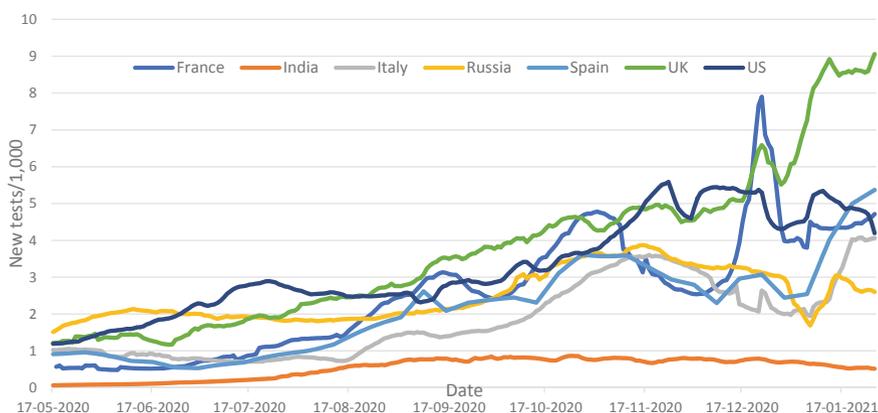

**Fig. 13.1** New tests smoothed/1000. *Source* Our World in Data
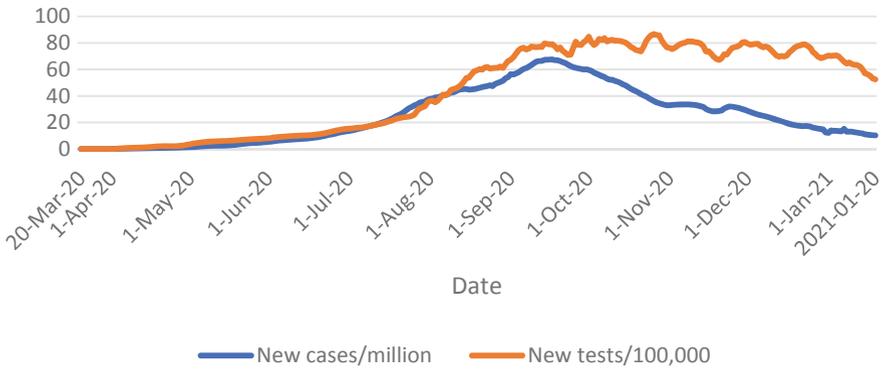
Fig. 13.2 New tests and new cases, India. *Source* Our World in Data

tests and cases, something that could not have been anticipated when the pandemic started picking up momentum.

India's position in total cases is second in the world, after United States, but its position in terms of deaths per million is more than 85th, indicating that India has escaped the heavy death toll experienced by other countries with a high burden of cases, even allowing for some underreporting. There are speculations about the reasons for this but no firm conclusions have yet emerged [10].

Clearly, one cannot wait to see what turn a pandemic will take. India was not prepared for the pandemic and it was unable to increase testing rapidly in the initial months. The Parliamentary Standing Committee on Health and Family Welfare, in its report submitted to the Parliament in November 2020, noted that poor contact tracing, low testing, and large scale use of rapid antigen tests (RAT) instead of the more reliable reverse transcriptase-polymerase chain reaction (RT-PCR) tests, could have impacted India's containment strategy adversely [11]. The Committee recommended that the number of testing facilities should be increased and accurate tests, such as the RT-PCR test, should be utilized. One reason for delayed ramping up of testing had to do with inadequate capacity—kits, reagents, infrastructure, and trained personnel—that prevented states from rapidly increase testing; the state-level variation in testing rates has been a major feature of India's response [12].

In addition to the lack of adequate and quality testing and the galloping cases that India had to confront, the reality was that India's totally unprepared health sector reeled from the sheer onslaught of COVID-19 cases. In terms of hospitals, hospital beds, health personnel, and medical supplies including personal protective equipment or PPE, the country was found floundering and trying to rectify the gaps in real time. The story of PPE, in fact, is interesting. At the start of the pandemic, India had negligible capacity for producing PPE and was dependent on imports. But by July, 2020, India had become self-sufficient in PPE production due to high-level engagement of the government, especially the Ministry of Health and Family Welfare (MoHFW) and the Ministry of Textiles [13].

The fact that this could happen within a few months is heartening. But at the same time, no estimates are available of the number of infections and possible deaths that happened due to the lack of protective gear for healthcare providers. Increasing infections among providers during these months, reported in the media, does raise the question of the costs of being unprepared to deal with catastrophic shocks like the COVID-19 pandemic [14].

Clearly, India was not prepared. Its health infrastructure, personnel, medical supplies, and logistics—all were found inadequate to deal with the increasing load of COVID-19 cases. The question is why was it not better equipped? India had faced epidemics and pandemics before this as well and each time it had been offered an opportunity to refocus on the health sector. While nothing like the scale of COVID-19 had occurred before, there are instances of effective interventions around prevention and containment, especially at state level. Some examples are the plague in Surat and more recently the Nipah virus outbreak in Kerala [15, 16]. In both cases, state/local governments undertook a variety of actions and took note of the gaps that existed in the health systems as also in basic civic amenities that needed rectification. Lessons were learnt from the way Surat cleaned up the city and subsequently became one of the cleaner cities in the country. As for the Nipah outbreak, Kerala government's swift actions have been widely acknowledged as a model to be emulated [17]. However, it does not seem that such state-specific learnings were incorporated in modifying the national approach to dealing with epidemics and pandemics.

In its Annual Report 2020, the Global Preparedness Monitoring Board pointed out five areas of action: responsible leadership, engaged citizenship, strong and agile national and global systems of global health security, sustained investment in prevention and preparedness commensurate with the scale of a pandemic threat, and robust global governance of preparedness for health emergencies [18]. Clearly, sustained investment is a critical factor in preparing the health sector. While there is almost always complementary funding from other sectors given the nature of health goods and services, core financing for the health system always takes place via the department of health, making such financing a critical tool in the hands of policy-makers [19, 20].

Preparing the Health Sector for Shocks: The Role of Health Financing

The WHO Health Financing Team has laid down two objectives of health financing in the current context: (1) ensure sufficient funding for common goods for health (CGH) and (2) remove financial barriers for health services. CGH includes comprehensive surveillance (including laboratories), data and information systems, regulation, and communication and information campaigns [21]. Financial barriers can be removed or reduced by strengthening the health services within the government sector, removing user fees, and ensuring universal health coverage. To achieve these

twin objectives, it is necessary to prioritize the health sector through increased and sustained government funding as well as reprogramming funds to achieve greater efficiency. Specifically, adequate funds are required to strengthen health infrastructure, personnel, medical supplies, drugs, health administration, medical education, and health coverage—the major heads of expenditure.

1. Availability and functionality of health systems in India

A recent attempt at ranking countries based on a number of indicators for global health security capabilities in 195 countries gave India an overall score of 46.5, with 100 as the best security condition [22]. Of the six sub-domains that go into making this index, India does the worst in 'prevention of the emergence or release of pathogens' and 'sufficient and robust health system to treat the sick and protect health workers.' India also gets fairly low scores on 'commitments to improving national capacity, financing and adherence to norms,' and 'early detection and reporting for epidemics of potential international concern.'

Severe shortages in both infrastructure and personnel have persisted over the years and are present in both rural and urban areas [23]. This was apparent during the early months of the pandemic crisis, when it had become difficult to find sufficient number of hospitals, hospital beds, or testing centers, and the government had to set up additional facilities in real time. A less discussed aspect of limited preparedness during pandemics is the squeezing out of other kinds of care. During the COVID-19 pandemic, for example, non-COVID care was bound to get squeezed out, especially in resource-constrained settings with inefficient health systems [24].

In terms of infrastructure and personnel, India compares poorly with other countries in the group of lower middle-income countries. Table 13.1 presents three indicators on physicians, nurses, and midwives, and hospital beds for selected countries with geographic spread. Bolivia, Ghana, the Philippines, and Sri Lanka from the lower middle-income group of countries like India and China, Indonesia and Thailand from the upper middle-income group, based on the World Bank classification. India, Indonesia, Sri Lanka, and Thailand are also in the South and South-East Asia

Table 13.1 Key health system parameters across selected lower middle- and upper middle-income countries, latest year available

Country	Physicians/1000	Nurses and midwives/1000	Hospital beds/1000
Bolivia	1.6	1.6	1.3
Ghana	0.1	4.2	0.9
India	0.9	1.7	0.5
Philippines	0.6	4.9	1.0
Sri Lanka	1.0	2.2	4.2
China	2.0	2.7	4.3
Indonesia	0.4	2.4	1.0
Thailand	0.8	2.8	2.1

Source World Bank Open Data [25]

WHO group. Thailand has one of the most successful universal health coverage (UHC) programs in the region.

Generally, the ratio of physicians per 1000 population is low for all the countries except China. India is somewhere in the middle on this indicator. In absolute terms, the ratio of less than 1 for physicians per 1000 is an impediment in delivering adequate health services to the population. However, India is unequivocally doing poorly in terms of nurses and bed availability, especially when compared to China, Sri Lanka, and Thailand.

The latest Rural Health Statistics 2018–19 brings out sharply the serious shortages in health personnel and infrastructure. For example, community health centers, which provide specialized medical care, had 79.9% of surgeons, 64% of obstetricians and gynecologists, 77.5% of physicians, and 69.7% of pediatricians positions vacant as of March 2019. In the case of primary health centers, there were shortfalls for health assistant (female), lady health visitor (LHV) (47.9%), male health assistant (59.8%), and allopathic doctors (6%) of total requirements at all India level. The shortages were worse in the empowered action group (EAG) states requiring extra focus like Odisha, Rajasthan, Chhattisgarh, Madhya Pradesh, Uttar Pradesh, Jharkhand, Uttaranchal, and Bihar. There are serious shortages of infrastructure in many states, but more so in the EAG states [26].

The area that is less amenable to analysis pertains to drugs and medical devices. Inter-country comparisons are not easily available since this is one area that is affected by numerous domestic policies around pricing, procurement, and trade. For India, this sector comes under the Department of Pharmaceuticals which is under the Ministry of Chemicals and Fertilizers. But unlike drugs—where India is leading in generics—India has been dependent on import for medical devices; 80% of its medical devices were import-dependent at the start of the COVID-19 pandemic [27].

As discussed above, during the COVID-19 crisis, the first few months witnessed a severe crunch in terms of essential medical supplies like PPE, testing kits, and disposables among others. The shortage of hospital beds was widely reported daily in the media. All energies and much of the resources went into fixing the system, and impacted all types of care. However, estimates are not as yet available to help us understand the costs of foregoing non-COVID care.

Fortunately, India could step up its production capabilities in some medical supplies and is now exporting a number of items that it had earlier mainly imported; the *Atmanirbhar Bharat* (self-reliant India) call of the Prime Minister was useful in this context. While medical supplies and drugs are funded from the budget of the Department of Pharmaceuticals, the MoHFW's funds go into supporting the other health system functions including personnel, infrastructure, medical education, health coverage, and health administration. Drugs and medical supplies complement health system inputs like personnel and infrastructure and together form the backbone of a functional health system.

Table 13.2 Key indicators of health financing from National Health Statistics, India

Indicator	2004–05	2013–14	2016–17
Total health expenditure (THE) as a % of GDP	4.2	4.0	3.8
Government health expenditure as a % of GDP	0.84	1.15	1.2
Total health expenditure per capita (Rs.) (at constant 2011–12 INR prices)	2066	3174	3503
Government health expenditure as a % of THE	22.5	28.6	32.4
Center-state share in government health expenditure	26:74	34:66	31:69
Out-of-pocket expenditures (OOPE) as a % of THE	69.4	64.2	58.7
Social security expenditure on health as a % of THE	4.2	6.0	7.3

Source National Health Accounts India

2. **Health finances in India before COVID-19**

Table 13.2 shows the National Health Accounts (NHA) estimates for India on key health financing indicators. The first NHA estimates were published in 2004–05, and the latest available estimates are for 2016–17 [28].

The total health expenditure has gone up marginally from 3.8 to 4.2% of GDP between 2004–05 and 2016–17. However, the key policy tool is government health expenditure which has remained almost the same over the past 12 years, around 1% of GDP. The major part of total health expenditure is from non-government sources comprising out-of-pocket expenditure (OOPE), which has declined somewhat over the years from about 70% but still remains high at 59%.

An important feature of India's federal financing structure is that a major part of total health finances comes from the states. As health is a state subject, states are responsible for implementing most of the policies and programs. While earlier, states contributed 3/4th of total government finances on health, this ratio has improved somewhat but still remains mainly tilted toward states as major spenders, with about 70% of total resources coming from the states. Most states spend a very modest share out of their gross state domestic product (GSDP)—much below 2%—on health [29]. For total health finances to increase, states will have to put in major efforts to improve the priority they accord to the health sector. At the same time, the Center has to increase its allocations to the MoHFW to more than the 0.3% of GDP that it allocated to health in the last budget 2020–21. The recommendation has been to raise total government health financing to at least 1–3% of GDP [30, 31]. The National Health Policy has indicated that the aim should be to raise government spending to 2.5% of GDP by 2025.

How does India compare with other countries on health financing indicators? Fig. 13.3 shows two key parameters on which countries have prioritized their health spending. The percentage of government expenditure to GDP for health indicates the overall prioritization and shows that India has been least able to give importance to health in its GDP. The second parameter shows the extent of prioritization within the overall government budget which gives the same story: India spends a mere 3% on health out of its total government expenditure, whereas countries like Bolivia,
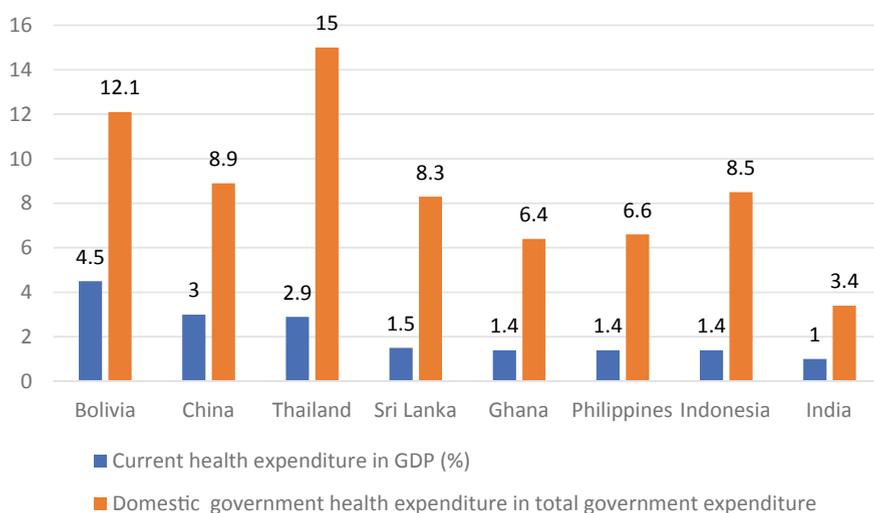
Fig. 13.3 Key indicators of prioritization of health, selected lower middle- and upper middle-income countries. *Source* World Bank Open Data

Thailand, China, and Indonesia spend a much higher portion of their government budget on health, with Thailand spending as much as 15% of its total government expenditure on health.

Figure 13.4 presents per capita expenditures on health for the government and OOPE for 2018. Countries like Bolivia, China, and Thailand have significantly higher per capita government expenditure on health; India's number is comparable only to Ghana. As for OOPE, Thailand, with a successful UHC program, spends the least on OOPE and the most on government expenditure per capita, and can be taken as a benchmark for other countries to follow. In fact, based on WHO's UHC index of service coverage for 2017 in this group of countries, Thailand has a score of 80, followed by China (79), Bolivia (68), and Sri Lanka (66). India's score is 55. Evidence is clear that UHC is positively correlated with higher investment by the government on the health sector [32].

The reasons for continued high OOPE in India are inaccessible and unavailable services in the government sector compared to a much easier to access but high-priced private services. As Table 13.3 indicates, the National Statistical Survey (NSS) 75th round in 2017–18 showed that 55% of total cases were hospitalized in private hospitals. Government facilities were availed by only 42% cases [33].

This translates into high OOPE. The average medical expenditure per hospitalization case for government hospitals was INR 4452 (61.31 US dollar) compared to INR 31,845 (438.52 US dollar) for private hospitals, a difference of more than seven times between the two. According to the NSS data, more than 80% of individuals reported not being covered by any health program and less than 5% of these expenditures were reimbursed.

PPP (current international dollar)
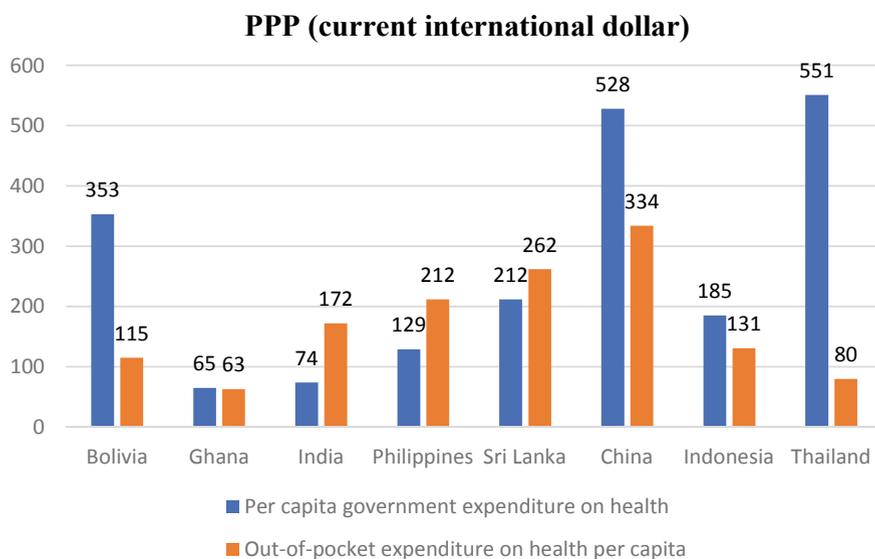
Fig. 13.4 Per-capita expenditure, key health finance variables, selected lower middle-income countries, 2018. *Source* World Bank Open Data

Table 13.3 Break-up of hospitalization cases by type of hospital, 2017–18

Type of hospital	Rural (%)	Urban (%)	Total (%)
Government/public hospital	45.7	35.3	42.0
Private hospital	51.9	61.4	55.3
Charitable/trust/NGO	2.4	3.3	2.7

Source NSS, 75th round

Non-hospitalization care or out-patient or OPD care also mainly takes place at non-government facilities. Only 30% of ailments overall were treated at government facilities in 2017–18, though the difference between the two costs are less compared to hospitalizations—private treatment was about 3 times higher than government treatment.

The preceding discussion indicates that available, accessible, and quality public sector services at all levels including for non-hospitalization care need major strengthening in the country if the dependence on OOPE has to be reduced and costs from shocks like pandemic are to be minimized.

Budget 2021–22 and the Health Sector

The 2021–22 budget was announced on February 01, 2021, by the Finance Minister of India [34]. Given the gravity of the situation, the expectations from the budget for the health sector were high, and it was hoped that India would finally take a quantum leap in its health financing situation.

The salient features of the budget are shown in Table 13.4. Some positive steps were taken in the budget for the health sector keeping in mind the pandemic. For example, a significant allocation of INR 35,000 crores (4.81 billion US dollar) was made for COVID-19 vaccination from the Ministry of Finance, which was absolutely essential given the urgency. Also, realizing the need to have resilient health systems in place to combat pandemics and epidemics, a sizeable allocation of INR 64,180 crores (8.82 billion US dollar) was made, to be spent over six years, to strengthen the different tiers of the health system under the program *Aatma Nirbhar Swasth Bharat Yojana.* This includes investment on health and wellness centers or primary care, integrated public health laboratories, and strengthening existing and adding new public health units, among other interventions. Additionally, the Finance Commission (FC) gave a grant of INR 13,192 crores (1.81 billion US dollar) to the states with the objective of strengthening the state health sector.

Also, this year, the Finance Minister made a strong argument for including water and sanitation in the country's agenda for health and well-being, and allocations for water and sanitation almost tripled over the previous year's budget estimates. The nutrition component—*POSHAN Abhiyan*—under the Ministry of Women and Child also got a boost.

With all these components added in, the Finance Minister argued that there has been a 137% increase (row 11, last column in Table 13.3) in health and well-being. Water, sanitation, and nutrition, critical social determinants of health, impact health outcomes directly and need strengthening. However, most of the core functions of running the health sector to build a robust health system—spending on infrastructure, personnel, public health, health coverage, and medical education—fall within the domain of the MoHFW. These require a sustainable increase of funding and not periodic grants. Table 13.3 shows that there is an 11% increase in the 2021–22 budget estimates compared to the 2020–21 budget estimates for allocations for MoHFW, which include the Department of Health Research and the Ministry of AYUSH combined. However, if the new allocations are compared to the 2020–21 revised estimates, then there is an actual decline of about 10% in allocations. While some of the commitments of *Atmanirbhar Bharat* may come from extra-budgetary sources, a significant part—it can be assumed—is already included in the main budget of the MoHFW, as has been the case in past budgets. This decline is because of a significant decrease in allocations under family welfare, human resources for health, medical education, and miscellaneous items like allocations for the Central Government Health Scheme and for international cooperation. The decline in the budget for family welfare is a worrisome feature as is the decline under human resources. Also, the Prime Minister's flagship program, *Ayushman Bharat*—which can be quite

Table 13.4 Health outlays in budget 2021–22

Item	2019–20 Actuals	2020–21 Bankers edition (BE)	2020–21 Revenue expenditure (RE)	2021–22 Bankers edition (BE)	Revenue expenditure (RE) to bankers edition (BE) growth (%)	Bankers edition (BE) to bankers edition (BE) growth (%)
Department of Health and Family Welfare	62,397	65,012	78,866	71,269	−9.6	9.6
Department of Health Research	1861	2100	4062	2663	−34.4	26.8
Ministry of Health (1 + 2)	64,258	67,112	82,928	73,932	−10.8	10.2
AYUSH	1784	2122	2322	2970	27.9	40.0
Health + AYUSH (3 + 4)	66,042	69,234	85,250	76,902	−9.8	11.1
Water and sanitation	18,264	21,518	17,024	60,030	179.0	252.6
Nutrition	1880	3700	600	2700	350.0	−27.0
Support for COVID vaccination	–	–	–	35,000	–	–
Finance Commission grant to states for health	–	–	–	13,192	–	–
Finance Commission grant for water and sanitation	–	–		36,022	–	–
Total (5 + 6 + 7 + 8 + 9 + 10)	–	94,452	102,874	223,846	117.6	137

expensive if it actually achieves the entire coverage of the targeted vulnerable population—also has not received any increase under the current budget [35], nor have HIV/AIDS and STDs. Overall, the National Health Mission component has received a very modest increase.

In sum, while attempts have been made to increase allocations to improve the overall health and well-being of Indians, the allocations for core health sector activities have remained low. MoHFW together with AYUSH has been spending about 0.3% of GDP on health. Given the economic shock and the various alternative estimates of GDP, it is a bit premature to guess what the share of this would be in the 2021–22 GDP. But assuming that the GDP will not contract too much below the 2019 level, we still get a similar number which remains below 0.4%.

Clearly, COVID-related finances cannot replace the much-needed funding for different components of the health sector. It cannot, therefore, be said that India's health sector has received a major boost in funding in the 2021–22 budget.

Summary and Conclusions

The year 2020 has been a disruptive one in every sense—economically, socially, and health-wise. The loss of economic activity and the consequent slowdown of the economy has hit governments and citizens alike, and budgets have been hit hard. While unemployment has risen significantly and livelihoods have been lost, one would hope that with the opening up of the economy and a significant decline in COVID-19 cases, India will bounce back in the coming years. With a tight budget situation, it is understandable that the government will not be able to allocate significantly higher amounts to its various sectors. However, given the criticality of the health sector, it was hoped that it would get greater prioritization with higher allocations on important budget sub-heads. But that has not happened and with a meager budget, it is not possible for core functions like public health, infrastructure, personnel, and medical education to get the required focus.

The National Health Policy states a goal of 2.5% of GDP by 2025, and the government's Economic Survey, which precedes the budget announcements every year, states that 'an increase in public spending to 2.5–3% can substantially reduce out-of-pocket expenditure from the current level of 60–30%' [36, 37]. Public spending did not increase in the COVID year. However, it is important that public spending should increase soon at least in 2021. One cannot deal with an emergency like a pandemic by fixing the various dysfunctional parts of the health sector in real-time and trying to source funding in a variety of ways including setting up new funds like the Prime Minister's—Citizen Assistance and Relief in Emergency Situations (PM-CARES) Fund, as was done last year [38]. A routine budget lends transparency to sources and expenditure and is the only way of ensuring sustained prioritization. Transparency in policy-making and policy pronouncements is key to gaining public trust. It is important for information to be precise and clear, instead of being later interpreted by experts and researchers. It is hoped that there will continue to be dialogue, discussion, and information dissemination between the government and other key stakeholders and experts on ways to improve the health financing situation in the country.

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Part III
Impact of COVID-19 on Vulnerable Populations

Chapter 14
'I Just Want to Go Home': What the Lockdown Meant for India's Inter-state Migrant Workers

Check for updates

A. Philo Magdalene, Drishya Pathak, and Komal Mittal

Abstract The authors provide a commentary on the inter-state migrant exodus that took place after the government imposed the national lockdown to control the transmission of COVID-19 infection. The lives of the inter-state migrant workers were seriously disrupted when the national lockdown was imposed. The authors bring into focus the inequalities of our times that resulted in serious human right violations. Migrant laborers were the hardest hit during the pandemic. Migrants and their families were pushed to starvation, deprivation, and destitution. The authors study this problem from a rights-based perspective.

The unprecedented lockdown resulted in a migrant frenzy. Millions of inter-state migrants, stripped of their livelihood, were forced to flood the roads across the country in the last desperate bid to return home to their villages. Many chose to walk for weeks and weeks covering thousands of miles in their desperation to get home.

The authors discuss the horror that migrants faced as they went through their journey. The nightmare that ensued was a severe violation of human rights. Bedraggled, starved, and exhausted, the exploitation and hardship that they endured along with their families continued over time.

The migrant crisis not only hit the headlines in India but also drew the attention of world media.

> In the last two days different sets of policemen have beaten me and my co-workers more than four times. One constable made me crawl on the road because I was violating the lockdown. In many villages that we have passed through, people have thrown stones at us, saying that we are carrying the virus. We do not have any money left with us and we have not eaten anything for the last one day, but we are going to continue walking, because we just want to reach home [1].
>
> India Development Review, March 29, 2020

Loss of dignity, livelihood, and starvation were hardly reckoned when the world's largest democracy declared a historically unprecedented 21-day lockdown on March 24, 2020, in a bid to protect its 1.3 billion people from the coronavirus disease. A

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decision taken at such a monumental scale with little insight and brazen unpreparedness impacted the nation's public health response forcing the pandemic to take a back seat. More importantly, however, it resulted in human rights violations. A migration frenzy never seen since the Partition of 1947 was triggered as millions of inter-state migrant workers were stripped off their livelihoods and were forced to flood the roads across the country in a last, desperate bid to return home as their basic human rights were threatened. This utterly unjustifiable state of affairs inadvertently facilitated by the government went on to reveal that India grossly lacked a humanitarian and rights-based response in its fight against COVID-19.

An accumulation of migrant experiences, which was across all media platforms during the COVID-19 lockdown, was what it took for us to finally take note of the following truth: Ninety-three percent of India's workforce is the informal sector and a large proportion of it is comprised of inter-state migrant workers who constitute 20% of India's workforce. They are vital to every economic sector, including micro-, small, and medium enterprises (MSMEs) that form almost 50% of the nation's gross domestic product (GDP) [2, 3]. This faceless majority, whose labor is vital to urban life, forms the economic backbone of the country. They are also among those that are the most exploited, impoverished, and powerless workers in India. For such a community, with no economic or social security, surviving on the barest means away from home, mistreated by employers and contractors, and disregarded by the government, the COVID-19 lockdown—implemented in the hastiest of manner—was the ultimate stroke that severed their fragile thread of day-to-day life.

Suspension of all modes of transport, closure of private, commercial, and industrial establishments throughout the country, enforcement of the Disaster Management Act of 2005 on the night of March 24, 2020, with merely four hours of notice, set off not just one wave but an endless series of mass movements of migrants to their hometowns that continued through many months. On the very first night, thousands of migrant workers, many with their families, gathered the little belongings they had, carried them in bundles on their head or in makeshift trolleys, and began their journey of thousands of miles. Convinced of their inability to brave the 21-day lockdown in their settlements, the fact that many chose to walk for days and weeks on end with hardly any resources for travel indicates how little support or economic assurance they had from their employers and contractors. They could not rely on government services as most of them lacked a ration card and had no access to the Universal Public Distribution System (UPDS).

> I just want to go home. I want to go to Bihar. The police here are beating us, and we are not getting a bus to go home. We have been here for the last three days [4].

A young migrant boy from Bihar to an NDTV reporter in New Delhi, March 24, 2020

Viewing the deprivation-driven movement of migrants as predominantly a law and order issue, on March 29, 2020, the government ordered that all state borders be sealed to suspend the movement of migrant workers returning home. The state governments were directed to provide temporary shelter and food for those stranded. This order,

despite its overarching intent to contain the spread of disease and alleviate the hardship of migrant workers, only managed to provide an impetus for police brutality. Migrants were harassed, humiliated, and *lathi* (stick) charged for 'violating social distancing and lockdown measures.' Those who were already close to their home states were denied entry and turned away from the borders. Two days later, the government made an audacious claim to the Supreme Court that all stranded migrants have been taken off the road to the nearest shelters and 'as of 11AM on March 31, nobody is on the road' [5]. Disregarding its role in instigating fear and mass hysteria, the government went on to criticize 'fake and/or misleading news/social media messages' for causing panic and triggering the large-scale movement of migrants.

While there is no end to allegations one may democratically raise against the government, it is equally important to acknowledge some of its decisions that helped alleviate the distress of the inter-state migrant workers. A series of mitigating approaches adopted by the government were hailed as essential, but at the same time were widely criticized for their inadequate and often reactive nature. On March 26, 2020, the Ministry of Finance announced a Rs. 1.7 lakh crore (22.6 billion US dollars) relief package for the poor and launched a food security welfare scheme which assured minimal provision of food to migrants, regardless of the availability of ration cards. This was taken a step further when local *panchayats*, in many states, mobilized food resources for the migrants stranded in their areas. Despite the central government's care packages and grassroots-level interventions in many areas, the provisions failed to fully meet the demand. Migrant laborers began to trade off their belongings to deal with starvation. When the lockdown measures were not lifted after 21 days as proposed and continued through the months, more and more migrants lost hope and chose to walk home as their little savings had dried up and they could no longer pay rent or afford a meal. Left to fend for themselves and deprived of any human or worker rights, the danger of COVID-19 seemed inconsequential to them as the only safety net within their reach was the comfort of their home village which was thousands of miles away.

As this mass exodus set in motion a tremendous logistical enigma, many state governments announced the dispatch of bus services to take them to their villages which led to hundreds of thousands of migrant laborers thronging the bus stations. This flicker of hope in finding a way to go home, however, did not last for many. In places like Delhi's Anand Vihar bus terminal, where the number of migrants far exceeded the number of buses available, their apparent inability to keep calm or practice social distancing attracted harsh crowd policing. A similar sense of desperation and anguish ensued when the Indian Railways introduced 'Shramik Special' trains in the month of May for migrants carrying e-passes to return to their home states and districts. While the e-pass was intended to streamline transport and avoid overcrowding in trains, it ended up serving as another barrier. Migrant workers were forced to rely on a third-party that often demanded money to register and book travel. Many prepared to continue walking rather than waiting indefinitely for their turn as the trains, despite covering over 5 million migrant workers, failed to meet the endless rush.

Lack of food, water, and sanitation facilities in train journeys as long as 60-h was the price that the migrant workers had to pay to reach home. Within a month of functioning, the Railway Protection Force reported around 80 deaths in the Shramik Special trains, many of which were due to exhaustion, heat, and hunger. A study by independent researchers which covered the period between March 19 and July 4 charted COVID-related deaths through data collected from newspapers and other reports (not including deaths by infection). It revealed that some 216 deaths occurred due to starvation and financial distress, 209 deaths were due to accidents during reverse migration on road, 12 deaths were due to police brutality, 48 deaths were due to exhaustion and standing in lines, 49 deaths occurred in quarantine centers, and 133 deaths were by suicide due to fear of infection, loneliness, lack of freedom of movement, and inability to go home [6]. Behind these statistics lie a significant number of migrant laborers that none can ignore. Disturbing reports continued to emerge of migrants crowding in oil and milk tankers desperate to return home and many being hosed down with disinfectants, bleach, and soap water in their hometowns, not to mention the harassment and stigma that they were subjected to alongside the pressure of unemployment. The nightmare that ensued during the first lockdown has not fully seen the end of day as many migrant workers still continue to struggle. Bedraggled, starved, and exhausted, the exploitation and hardship that they were forced to endure along with their families, children, and cradled infants, are a never-ending tale that requires voluminous documentation to pin accountability for its unfathomable human rights violations.

The fact that this scenario played out despite the government's best claimed efforts indicates that there is a larger problem that needs to be addressed at many levels primarily by the labor contractors and employers who constitute both MSMEs and major industrial sectors. It also points to the questionable implementation by the government of the Inter-State Migrant Workmen Act of 1979. The Periodic Labour Force Survey of 2018–19 revealed that more than 69.5% of the informal migrant workers did not have a written contract, 53.8% were not eligible for paid leave, and 51.9% did not have any social security benefits [7]. A right to information (RTI) filed by an activist revealed that of the estimated 2.1 crore inter-state migrant workers in India, only 84,875 were registered under the act. The migrant crisis could have been largely averted if most of the migrants had been registered and if the legal provisions were strictly adhered to through the guarantee of livelihood and accommodation, wage reimbursements, travel allowances, and legal assistance. Recession looms in India as returning migrants search for employment. The greatest human rights threat would be the total roll back of the labor laws and workers' rights which the governments of Uttar Pradesh and some other states have already pushed to implement for the benefit of business and industry. Fueled by this decision, if large-scale industries continue to neglect the welfare and rights of their own migrant laborers, no amount of corporate social responsibility directed elsewhere will undo this social injustice.

'Inequity defines our time,' a saying that has historically been relevant, is progressively gaining new significance alongside development and progress. It necessitates a conscientious and rights-based approach on the part of the government and other

stakeholders to avert conditions that normalize social inequity and aggravate human rights violations. In contrast, India's lockdown measures, at the time of implementation, lacked proactive foresight and stayed blind to the concerns of the communities, thereby unraveling a humanitarian crisis.

> I made some decisions that caused you suffering, my poor brothers and sisters. But for a nation like India, this was necessary [8].

Prime Minister Narendra Modi addressing the nation on *Mann ki Baat*, March 29, 2020

One cannot accept this justification and half-apology provided by the Prime Minister. Yes, a country-wide lockdown was necessary for India. But not haphazardly, at the cost of bringing suffering to the poor, whom the lockdown had intended to protect. If the nation's fight against COVID-19 necessitates such a social injustice, then sadly what we have is no ethical public health response. It is high time the country owns up to its responsibility and considers the upholding of social justice as its highest duty.

The migrant crisis in India drew the attention of world media as it was a unique consequence of the COVID-19 lockdown never witnessed anywhere else in the world. In addition to all the grave concerns it embodied, the crisis also brought our attention to the altruism and public benevolence of ordinary folks, volunteers, non-governmental organizations, and civil society who enthusiastically attempted to fill the gap that the government and commercial sectors had failed to cover. Of course, their interventions can in no way resolve a crisis of such magnitude. Nevertheless, it leaves us with a sense of optimism that in a time of any crisis, the concerned public will step up, self-organize, and coordinate a response holding hands with the public institutions. India has time and again been testament to this.

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Chapter 15
From Vulnerability to Resilience: Sex Workers Fight COVID-19

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Abstract The authors describe the plight of sex workers, a particularly disadvantaged community that is highly marginalized and vulnerable. Sex workers were hard hit by the pandemic. The authors examine the impact of COVID-19 on sex workers' lives and livelihoods, their response to the crisis, and the strategies that they employed to battle the pandemic.

During the lockdown, female sex workers lost their livelihoods which plunged them and their families into extreme poverty. Even when unlock measures were announced, the business of sex work did not return to normal. Sex work, by its very nature, demands physical proximity—not physical distancing. Consequently, sex workers had to innovate to find work to survive. Loss of livelihoods also brought forth hidden mental health problems. Gripped by anxiety and depression due to the uncertainty about when the pandemic would end, sex workers went into despair. Some even attempted suicide. Violence in the family increased significantly. For sex workers living with HIV, there was the added anxiety about the continuation of anti-retroviral therapy (ART). Community-based organizations (CBOs) took on the responsibility of providing drugs to sex workers by developing a unique supply chain. The CBO members collected the drugs from the health centers and deliver them to sex workers at a mutually convenient place, thereby ensuring confidentiality.

The authors draw attention to sex workers who are invisible in most discourses. This vulnerable, marginalized community was seriously affected by the pandemic.

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Sex workers were victims but were also the first responders to the pandemic. Sex worker collectives formed to fight HIV, were by their very nature, well-equipped to fight the COVID-19 pandemic. The government's announcement to provide rations to the poor was a welcome move, but it was not of much help to sex workers as they did not possess ration cards. The sex worker collectives valiantly fought this battle and won. The Supreme Court of India directed the states to provide sex workers with dry rations without insisting on any proof.

The stories of the lives and resilience of sex workers, narrated in this chapter, are inspiring. The authors discuss the plight of female sex workers during the COVID-19 pandemic. The community of sex workers was missing from all government policies and welfare schemes. The sudden lockdown robbed them of their livelihoods. Basic necessities like food and shelter became elusive. The authors relate the stories of the struggles of sex workers from different parts of the country.

They discuss how despite uncertainty, stigma, and loss of livelihoods, sex workers emerged strong. The resilient spirit of sex workers should be celebrated. The stories of sex workers have a common thread of resilience, resourcefulness, grit, and determination in the face of unsurmountable challenges.

Introduction

We are considered immoral women in society and are subject to continuous harassment, violence, and discrimination. During the past several years, we fought the battle with HIV and made significant progress. We distributed condoms, brought our friends to clinics, and ensured that all HIV positive persons took regular medicines. With the help of our collective strength, we earned self-respect and dignity. HIV taught us to fight our battle collectively.

Now, COVID seems to damage everything. It has destroyed our livelihoods and our lives. We, at our community-based organization, are doing everything that we can. We are distributing dry rations, masks, and sanitizers and are teaching our friends to keep themselves safe. Now, we have to go beyond our community and help many others. It is like living the past. We need to assert ourselves and save lives—once again. WE WILL DO IT and EMERGE VICTORIOUS.

Member sex workers collective, Delhi, India

Sex workers include female sex workers (FSW), male sex workers (MSW), and transgender (TG) persons. They offer sexual services for cash or commodities. Sex workers bear a heavy burden of HIV infection. However, following the HIV/AIDS epidemic and the efforts of governments, non-government organizations, community organizations, and international donors, a deeper understanding of sex workers and sex work has emerged [1]. Multiple identities of a sex worker being a mother, partner, friend, community member, and above all a human being are recognized, and therefore, sex workers are being counted. People have started to understand that the issues sex workers face are similar to everyone's everyday challenges—earning and managing money, juggling family and other relationships, and being concerned about children's education and their future. Building on wider acceptance by society,

the National Human Rights Commission of India, in its latest advisory, recognized sex work as 'informal sector work' [2].

Like many businesses, sex work has been significantly affected by social distancing/physical distancing measures and closures during lockdowns [3]. The pandemic has made it more difficult to work safely and has cut off reliable sources of income. Millions of sex workers are in the difficult position of having to choose between their health and being able to afford food and rent. The current global pandemic has also re-ignited issues related to stigma and discrimination [4]. While the government announced various measures to help the poor during the lockdown, sex workers were left out from these social protection frameworks [5]. Sex workers continued to be missing, even as an afterthought, from government policies and welfare schemes. They were left to fend for themselves and seek support from limited grassroots and civil society organizations or individual philanthropists. Some of them needed to find ways to work despite the dangers it poses.

Sex work by its very nature entails frequent bodily contact and human interface. The 'unlock' (re-opening) phases announced by government did not help sex workers get back to work. While teachers moved online, shopkeepers put up small barricades between themselves and their customers, and other businesses made adjustments to maintain the mandatory physical distancing, it has been difficult for sex workers to operate with such restrictions. The pandemic and its ill-effects have severely impacted their livelihood opportunities.

Amidst these dismal tales, there is a glimmer of hope and compassion. During the last decade and a half, the battle with HIV/AIDS brought sex workers together under the umbrella of several community-based organizations (CBOs) across the country. Little did one realize that the efforts of these agencies would bear fruit once again during watershed moments such as these. With the support of the Lawyers Collective, sex workers recently won a battle in the Supreme Court of India which passed an order by which sex workers could be offered dry rations without having a ration card or any identification that the Public Distribution System normally demands [6].

The authors of this chapter approached female sex workers (FSWs) and their organizations across nine states, including five metropolitan cities in the country, to share their experiences on how they learnt about the pandemic challenges they are facing to survive. The stories from these sex workers are heart-wrenching. These stories underscore their struggle, desperation, coping mechanisms, their ability to share and care, love and bonding, as well as how they are using their collective agency to address problems. These stories have a common thread of resilience, resourcefulness, grit, and determination in the face of unsurmountable challenges. Once again, the power of the people who are viewed as powerless in society demonstrates that this too shall pass.

In this chapter, the social, economic, and mental health aspects that emerged as the most critical issues are discussed.

Social Dimension—Isolation, Marginalization, Societal Pressures, and Solutions Pursued by Sex Workers Collectives During COVID-19

The Immediate Impacts of the Lockdown

With the sudden announcement of the lockdown and physical distancing measures, sex workers were left as stunned as everyone else. Sex workers from small towns and villages normally migrate to large cities like Delhi, Mumbai, and Kolkata to find work in dance bars and brothels to earn a living. Much of their earnings are remitted back home to support their family members. However, with the onset of the COVID-19 pandemic, everything was closed.

> Corona is more dangerous than HIV. For any problem, we always discuss amongst us and come out with a solution. During the lockdown, physical meeting was not possible, so we got connected with each other through phones and planned to do something for our members. We have lost our income sources suddenly. Things were changing so fast; it was difficult to keep track. The lockdown days were scary.
>
> We cannot resign to fear alone but need to go that extra mile. We called all our contacts to seek help. We collected money, cooked in a community kitchen, and distributed masks and sanitizers. We might be last in the government's priority but for us our sisters' welfare is paramount. Though ours is a sex workers collective, we extended our help to the poor.
>
> Sex worker (Reshma from Rajasthan)

The lockdown announcement was too sudden and too severe [7]. The lockdown was announced toward the month end, and many sex workers were pressured to pay rent to their house-owners. With all their workplaces (bars and brothels) partially or fully closed, there was little hope of any employment or income. Many of the sex workers were also evicted from their homes and were forced to live on the street [8].

The idea of returning home was a difficult choice for most sex workers. While few chose to return home in hired vehicles, others decided to stay put. 'Either we die of hunger or we die of disease' was the common adage heard. Sex workers who left the city during the initial lockdown days found themselves returning to the city once again after a few months. They lamented that 'the situation in rural areas is more distressing. Lack of employment opportunities and the apathy of our political leaders is too much to bear'. The village economy is not suited to cater to the sudden influx of its own members. Many returned with urban experiences that saddled them with the economic expectations of their families.

Class, Caste, and Religion Are Major Barriers

The fault lines that run through the community are further exaggerated when society is experiencing major structural shocks. At every level, both in urban and rural areas

(more specifically in the latter), the feelings of belongingness to one's community, caste, creed, or religious faith take precedence. When sex workers arrived in their respective villages, the local police began to restrict their movements as was directed by the government. Mandatory quarantine of two weeks was enforced to ensure that the 'visitors' from urban areas would not spread COVID-19 in their villages. In many villages, the government schools were converted into makeshift shelters for quarantine. Some women were separated and locked up due to their lower social strata. This was the experience of many sex workers from lower castes.

Some of the women working in Mumbai as dance girls or sex workers returned to Rajasthan, where they belong to a specific community that lived in small hamlets outside the main village. People from lower castes and tribes often live in separate hamlets away from the main village. Social and physical distance ensure that people from upper castes are protected from any form of pollution from those from lower castes. People from upper castes live in their secured neighborhoods. Lower caste women from this community traditionally provide various forms of entertainment, including sexual services. Men from the main village seek sexual services from these women.

In times of a pandemic, communication based on scientific facts is often muted as rumors and misconceptions override it. With little information about the pandemic, the community chieftain barred the women from engaging in sex work. Following his directives, many young men started to keep vigil on women during the night, ensuring that they do not slip away to meet their clients. The men brandished sticks and knives, clutching them in their fists, ready to strike. Thus, a cloud of fear and anxiety was cast, leaving the women concerned about food for their children and the next meal for the family. Trapped in a situation that could escalate, the women felt isolated, worthless, and depressed.

Sex workers are unable to find alternative employment due to stigma and discrimination based on caste, class, and religion [9]. Some Muslim women in rural areas spoke about starting small businesses such as vegetable selling but were unsuccessful as patrons were unwilling to purchase vegetables from them. Some sex workers took up work in cottage industries (carpet-making and garments) but were later replaced with employers' own kith and kin. Only a handful of women from the lower sections of society were employed in the Mahatma Gandhi National Rural Employment Guarantee Act (MNREGA) scheme. While the young and physically able-bodied women were employed, they often had to provide a portion (up to 50%) of their income as informal payments to the contractors. Urban areas provided wider choices of vocations and anonymity allowing sex workers to make a temporary shift in their professions. They were employed as tea stall vendors and vegetable sellers.

With the strict rules of physical distancing, sex work came to a grinding halt during the lockdown. Women were scared as each piece of the puzzle of the pandemic portrayed a more dismal picture, weighing heavily on their lives. Their sources of income were threatened alongside concerns about infection from continuing to work in the absence of social protection. Many sex workers' husbands or boyfriends, who were employed as drivers, manual workers, and rickshaw pullers or sometimes took

up the odd job, were rendered unemployed by the sudden lockdown. Growing uncertainties, unemployment, and distress led to more vulnerability among the women. Husbands turned to alcohol to ease their distress, which further enhanced their frustrations. Women and children, with 'stay-at-home' messages, however, had nowhere to go to escape from domestic violence. Hardships and sufferings among the community were indeed on the rise.

In metropolitan cities, sex workers with access to technology learnt to apply innovative techniques to keep their clients engaged. In this 'swipe-left or swipe-right' world, losing clients meant parting with their only source of income. Some women attempted novel ways to keep their regular clients entertained. They moved to video chats, offered video sex, and were paid through digital payment gateways. Keeping abreast with technology was imperative for the business of sex work. Sex workers knew that well-paying customers used modern methods to reach them. However, lucrative as it sounds, shifting to video chats was not easy. Many sex workers lacked private space in their small, crowded homes, and many did not possess smart phones.

Sex Workers Collectives and Support

Across the country, many sex workers formed collectives, governed, and managed by the community. These CBOs were instrumental for health and development initiatives and were responsive to their needs. It was but natural for sex workers to share their concerns and challenges with the CBO leaders and volunteers when they faced hardships. In Mumbai, the CBO leaders reported that either the sex workers were stuck in the brothels as they owed substantial amounts to their madams and local money lenders or were unwilling to leave the city as they were well aware of the limited opportunities in rural areas. In the cities, there were still some opportunities. The CBOs helped some women to raise initial investments to start small ventures like tea stalls and vegetable shops as well as make sanitary napkins and masks. There was a mixed response to these initiatives as they did not provide enough money.

With the disease, desperation and depression engulfed all households. Sex workers faced discrimination and were almost the last to receive dry rations or any type of support. Many CBOs reached out to the media, individual donors, and faith-based organizations to seek immediate relief. Responding to the media's stories on the plight of sex workers, some organizations stepped in with financial aid. These organizations extended support to as many vulnerable families as was possible—especially to pregnant women, senior citizens, ailing patients, and children. Through the sex workers collectives, food, water, and other essential items moved freely from hand-to-hand, blurring the rigid caste and class lines.

Economic Dimension—It is Expensive to Live in Poverty: Limited Choices—Disease or Death

The year 2020 is packed with different tragedies all around us. Nobody seems to care for the poor, as everybody is looking after their own interest. The government announced some schemes for the poor, but they are simply not enough. Rich and poor, all of us, are experiencing this together. But the difference is this – when the rich catch cold and sneeze, the poor die of pneumonia. To feed my baby a milk packet everyday costs about 20 Rupees. I need 600 Rupees for one month. But the government, as part of its *Pradhan Mantri Garib Kalyan Yojana* (PMGKY), provides cash transfers of only 500 Rupees per month. Therefore, to feed the rest of my family, I have to venture out to seek clients and earn money. There is simply no alternative for us. If I am infected maybe…maybe I will be treated, but there is no healing for my hunger…

<div align="right">Sex worker, Mumbai, India</div>

During natural calamities like floods, drought, earthquakes, or even the sudden decisions of government like demonetization or COVID-19 lockdowns, the poor are most negatively impacted. Sex workers who tread the narrow line of surviving on income from client to client are the unseen poor who have little savings, no job guarantees, and no health insurance. The HIV epidemic taught sex workers collectives to be prepared for uncertainties. NGOs and CBOs worked tirelessly to ensure that sex workers had access to bank accounts and government identification cards (Aadhar Card and PAN Card). But many sex workers still do not have access to these entitlements.

'The year 2020 has robbed us of everything', a sex worker from Madhya Pradesh explained. 'It devoured our savings, our health and our income sources. It is a hopeless situation for us—our dreams are shattered, and our future appears bleak'. Sex workers rely on daily money from transactions. With the lockdown, cash evaporated from their hands. Less money generally meant shorter and sicker lives, smaller meals, and sacrificing children's education.

Police who were stationed at key junctions to monitor movements enforced mandatory lockdown. The police used force on those who dared to step out of line. Sex workers were confined to their brothels, and no client dared to visit them. While the lockdown continued to be extended in its various stages, people could no longer stay locked up in their houses, especially as prospects of containing the virus appeared dim. Slowly, the government loosened its grip on the lockdown measures and allowed life to crawl back to normalcy. However, the normal was not recognizable anymore. Sex workers said that there was suspicion everywhere. It did not feel like the same city, the same neighborhood, or the same people.

Public service announcements, newspapers, and every radio jingles promoted the 'Holy Trinity of Prevention'—wearing masks, washing hands, and maintaining physical distance. While these measures worked for many, they were challenging for sex workers, especially for those living in crowded brothels in slum areas or in joint living conditions. Water scarcity, lack of sanitizers, soap, and masks posed major challenges. Mandatory physical distancing was lethal to business. Many sex workers indicated that during the initial days of the pandemic, their decisions were guided by

fear and the need to protect themselves. The hope of winning against the pandemic was quickly fading. Hunger and uncertainty of the future now took hold of their minds. They could no longer heed the advice of the government or the experts, but had to take their fate into their own hands. They slowly let their customers in, but with an abundance of caution. Many started to sprinkle their clients with disinfectants and even applied sanitizers on their genitals which indicated that effective health messaging was urgently needed. Some women stated that they only catered to their regular clients. While in some situations, they tried to engage in safer sex, and others explored video sex and sex chats and transacted through money transfers. Some even shifted operations outside the containment zones hoping that their clientele would pick up since they needed money desperately.

Case study 1

Against the odds, we made it possible

Ajmer, an important pilgrimage town located in Rajasthan, hosts the *Ajmer Sharif dargah* of *Khwaja Moinuddin Chishti* which attracts millions of tourists. The economy of the town revolves around the various small enterprises connected with the *dargah* and tourism.

COVID-19 and the lockdown decimated tourism and sex workers were negatively impacted. Any truck carrying food and other essential items was *gheraoed* (surrounded) by poor men and women. There was no money for sex workers to even buy milk packets for their children.

'I wanted to sell whatever little I had, like gold and brass utensils. There were simply no takers. Shopkeepers refused to take these as cash was a problem. They were not confident if people would buy such things when all they could think of was the next meal', recalled Sameera (name changed), the leader of the sex workers' CBO.

The *dargah* was closed. Earlier sex workers engaged in small cottage industries making flower garlands and *agarbathis* (scented sticks used for worship). They also sold small souvenirs for tourists. With both the earning members in the house getting furloughed, it was difficult to manage. Earlier, at least one member was employed. This lockdown was harsh. Everything was closed.

Many sex workers felt that their problems were similar to the ones that they had faced during demonetization. Cash became a most precious commodity. Nobody was lending cash. However, little children fell sick often, and they needed cash to buy medicines, milk, and other essential items.

The CBO members discussed amongst themselves and made plans to meet with industry owners and political leaders. 'We needed help to organize ourselves. The local Member of the Legislative Assembly (MLA) came to our rescue when we shared the struggles of sex workers', Sameera said. She, along with other members, sought help from philanthropists and set up a small unit to make sanitary pads and face masks. They decided that this would

help sex workers and other women stuck at home to access cheaper products and would also provide employment opportunities in both manufacturing and distributing the products.

Necessity is the mother of invention. The CBO members came up with innovative ideas of negotiating with some housing cooperatives and distributing vegetables, fruits, and other essential items at their doorstep. They promised that complete hygiene would be maintained and with help of some housing society members, they could employ some more women.

Finding gainful employment in the vegetable business was not free of problems. They faced challenges with the police as movements were restricted. They were asked to get permission letters from the administration. The CBO members did try to intervene, but police were adamant. They refuse to let them travel on the road. They also arrested one of their members who was released only after paying a high bail amount.

When she returned from work, Lakshmi, a sex worker, found that her luggage and her children had been thrown out of the house. She was evicted since she could not pay the rent. A CBO member gave her shelter and accommodated her and her children in her house for a few days. The neighbors provided her food.

COVID-19 presented a gloomy picture as more and more women began to lose their homes and were in need of shelter which was not forthcoming from the government. These were the daily realities of sex workers. Therefore, instead of lamenting, the CBOs took proactive steps to come to the aid of their members and turned the crisis into an opportunity by thinking outside the box.

Sameera recalled the many lessons that she had learned and how she had implemented these learnings during the crisis. She said that the message was loud and clear, 'We must not, yet again, end up more fragile than when we started during our initial days of HIV'.

Health, Especially Mental Health—COVID-19's Additional Burden on Sex Workers

The music has stopped. We do not feel up to doing anything – loud giggling, quarreling over customers, whistling old songs – are all silenced. We just sit and worry. I have suffered alone for such a long period of time. Earlier, if one of us was sick or had lost a loved one, the other girls came to encourage her. Now it appears as if all of us have lost something. There is a lot of uncertainty. We don't know till when this will continue.

A female sex worker, Mysore

The lockdown led many people to shift to working from home. However, sex work cannot shift home when it is basically a one-room dwelling with many residents.

During the lockdown, most sex workers were confined to their home where they had problems. In conversation, a sex worker from Mysore said 'I have been staying at home for over two months. There is no certainty of resuming business. If I continue like this, I think I will become a complete wreck'.

'Television, which is the main source of information on COVID-19, is continuously displaying grim pictures of large-scale migration, impoverishment, and death. It is imperative for the vernacular television channels to also provide information on hope, safety, and well-being, during a time when the world is still awaiting a cure for COVID-19' said another sex worker.

Loss of work and livelihood brought forth hidden mental health issues among sex workers. Gripped by anxiety and depression due to uncertainty, sex workers were continually treading on water, trying to keep from drowning in despair.

However, on many occasions, they displayed anger and resentment saying, 'I do not know with whom I should be angry? The coronavirus for causing this pandemic or the government for implementing the lockdowns or the police and people around me that I am scared of or myself for feeling helpless?' said one sex worker.

Case study 2

Hopelessness, hunger, and hardship—A deadly concoction

It was late in the evening. Rekha, a young sex worker from Ahmedabad, Gujarat, was staring vacantly at her kids, Rakhee and Rajesh, aged 7 and 4. The children were hungry. Her husband had abandoned her a few years ago. It had been over two months of the lockdown and all her resources had dried up. As the children huddled close to her, she started telling them how worthless life is. She started to cry and so did the children. Her thoughts were around putting an end to this misery. She got up slowly and went to the adjoining room that served as a kitchen. She reached out for a bottle of kerosene. The kerosene had been sitting there for the last few days since she had not cooked anything because she did not have anything to cook.

She managed to drink almost half of it and forced the kids to do so. Soon the neighbors heard the kids and her vomiting loudly and barged into her home to realize what she had done. Using her phone, they called one of the leaders of the community organization that she was a member of and within a short period of time a group of sex workers, including the leaders, were at Rekha's home. They managed to get her to the hospital. After talking to the doctor, who conducted camps for them during the better days, they took Rekha and the children, who were now safe, back home. It was a traumatic night for everyone.

The leaders and the other women around talked about this, knowing that this attempted suicide was not an isolated event. They knew that many sex workers were facing mental health issues such as (what they called 'tension'), lack of coping, buckling under pressure to survive, depression, and other issues.

> They decided that there should be a way to provide psychological support. They made plans and rolled out a peer tele-counseling service. This was both reactive to people reaching them as well as proactive through regular calls to the members of the community organization to make sure that someone was enquiring about their well-being. This was most appreciated by all the women. They felt there was someone with whom they could talk about their situation, someone who was willing to listen and help. An antidote to the 'pandemic of loneliness' was produced.

Sex workers who lived with their family members—husband and children and in some instances their mothers and dependent children—faced several challenges. Relationships grew strained, and arguments and conflicts became common place. When their partners lost their jobs and did not have any income, partner violence, ranging from verbal to physical, was triggered. The children too faced violent outburst of elders in the family. It was increasingly reported that sex workers were facing domestic violence more than ever before. Many times, it would go unreported. Women who could gather the courage to report, feared arrest of their husband or boyfriend, which would exacerbate the problem.

Since the schools were closed and most of the children were trying to adjust to studying at home, the stress of providing them with educational tools, such as smartphones and computers, was a major challenge that the sex workers faced—a set of issues that went beyond the payment of fees. Providing supplemental educational aids and actual space for children to attend class from home in a single room was a challenge. This stress often resulted in the child discontinuing school. These women were forced to stop their children's schooling. The additional problem of engaging the children gainfully became increasingly problematic. Adolescents' exposure to drugs and other addictive substances was a serious threat. Watching their own elderly parents suffer in silence was also very difficult for the women. Caught between the children and the parents, often times, the women lost their sense of purpose. All these factors led to a significant level of stress, frustration, distress, and hopelessness. Many sex workers resorted to alcohol consumption. Increase in alcohol consumption and incidents of domestic violence became a complex web of daily life [10].

To keep children engaged with the online school system required better devices with quality Internet connection. Sex workers from Gujarat said that some children of sex workers were found begging as the parents could not afford food and other essentials for them. The collective members arranged to engage children of sex workers, along with other children in the slum who could not afford to go to school or join online classes. Many women talked about young girls (children of sex workers) being pushed to sell sex. Some of the collective leaders narrated their experience of how they were able to intervene in a few cases while in others they could not as they did not have any alternative. Some children were pushed to seek employment and to contribute to the family's income. Needless to say, children were easy prey to abuse, violence, and exploitation. It is imperative that they are protected.

For sex workers living with HIV, there was a general anxiety about continuation of antiretroviral therapy (ART). ART centers, located at government hospitals, were transformed into COVID-19 centers, causing people to be worried about access to an uninterrupted ART supply. Coupled with that was the fear of infection with COVID-19 since government messaging indicated that those who were immune-compromised were very vulnerable to COVID-19. With immune-compromised conditions, it was too risky for them to seek medical care and treatment [11].

COVID-19 lockdowns and restrictions in transportation were added barriers to seeking social support. Peer educators and outreach workers, who regularly followed up with their networks to distribute medicine and provide ongoing psychosocial support, were suddenly halted which resulted in increasing sex workers' social isolation. Fear, anxiety, worry, and challenges of living with HIV became more complex. Therefore, many sex workers living with HIV referred to themselves as the 'living dead' because they did not know what to do. Many people living with HIV (PLWH) had other underlying medical conditions such as tuberculosis (TB), hypertension, and diabetes. These not only added to their risks of contracting COVID-19, but furthered their apprehension of collecting medicines from ART centers.

Some of the young PLWH were employed and were fearful of losing their jobs if they were unable to take their regular medicines—including ART and other drugs. COVID-19 unleashed an array of emotions around being unemployed, socially and physically isolated, and unable to support the family. CBOs took on the responsibility of developing a unique supply chain for ART. They obtained information of their members in need of ART, collected the drugs from the center, and made sure that the medicines were delivered at a mutually convenient place (without compromising their confidentiality). CBOs also initiated tele-counseling for their members in order to keep in touch with and advocate for social benefits schemes. It is important that the government considers the needs of sex workers, PLWH, and children, especially girl children, and plans measures in a non-stigmatizing manner. Mental health is emerging as a growing and alarming issue in the lives of sex workers including those living with HIV, during the pandemic.

Case study 3

Sex workers double up as frontline workers to help society

Over the last twenty years or so, apart from being on the frontlines of HIV, the sex worker community has also been ready to provide a helping hand when it comes to social issues. They have, therefore, been earning social capital in situations where they were engaged on the frontline in providing solutions. For example, when there were floods, droughts, and other natural calamities, sex workers collectives, through their collective power, made inroads into the area of preventing sex trafficking.

During the HIV epidemic, sex workers were the barefoot soldiers distributing condoms, convincing other sex workers to visit clinics, and advocating for their rights. Most of the time, they moved during the night often in dangerous places. They never worried about the harm that could come to them as they always kept the need of their peers in their sight.

COVID-19 threw up major challenges but also presented opportunities. One was clear about the routes of transmission of HIV and outreach work which—despite being conducted at odd hours—did not pose as much risk as COVID-19. A mere conversation or a touch or a hug could be a gateway for infection with the virus. News was also flashing on television that doctors and nurses were facing stigma because they treated COVID-19 infected patients. Many sex workers, who lived in slums in urban settings, were aware of their own community members getting infected with COVID-19. Homeowners started to throw sex workers out and locked their doors. Not many people came forward to help.

Neeta Ben (name changed) was a CBO founding member in Gujarat. In the last 15 years of the CBO's existence, she had fought many battles for sex workers. Her opponents were the police, politicians, government officials, and common citizens. She raised her voice without fear and always stood for the progress of the sex worker community. She was well known for her 'impromptu' helping nature. So, when she decided to take the plunge into politics, nobody expected her to lose. She was a local counselor in the city representing a well-known national party. It was a proud moment for sex workers to see that one of their own in the City Council dared to talk about their rights. She was a strong voice in representing their issues.

When Neeta Ben learnt about the severity of the problem of COVID-19 that infected sex workers and their family members who were not fit to travel to the local government hospital, she arranged for transportation and helped them to get admitted. Slowly, the CBO learnt that stigmatization and discrimination were not confined to sex workers alone but extended to most people living in impoverished settlements. The CBO mobilized its team and helped many COVID-19 patients who were unable to seek immediate medical assistance. In this way, the work of Neeta Ben and her team soon expanded beyond sex workers to many others.

Doctors and nurses were also appreciative of the CBO's efforts and applauded them. Neeta Ben worked tirelessly for many months transporting, helping, and being with COVID-19 patients. Unfortunately, age was not on her side, and she tested positive to the same disease. She passed away after a few days of admission to the hospital. Her heart condition and other medical issues led to her death. Her commitment to selflessly help, not just sex workers but all poor people in need, will always be remembered. Other members promised to continue her legacy.

Her life was a living example of valor, sacrifice, and heroism.

Resilience of Sex Workers

The year 2020 will be known as the 'Year that changed the World'. The 'normal' as we previously understood it was disrupted. There were major transitions in economy, health care, education, jobs, and livelihoods. Schools and jobs quietly shifted online. Governments, charitable organizations, faith-based organizations, students, and the private sector tried to put their best foot forward to help those in need. Such a tectonic shift in the nature of humanity could not escape the sex worker community. Like everybody else, they too were victims of and also first responders to the pandemic. Sex workers collectives, most of which were formed to fight the HIV epidemic, were by virtue of their very nature well-equipped to respond to the COVID-19 pandemic. 'If we have to survive, we have to be COVID compatible!' said a female sex worker from Karnataka.

During the past few months, the authors have been having conversations by telephone and by holding virtual meetings with various sex workers across India. Conversations have been held with individuals, leaders, and collectives as well as with staff and supporters of sex workers and sex workers organizations. The idea was to learn about what happened during the lockdown period and during the unlocking (1 to 4) and to better understand the impact of these events on their lives.

Discussions with the community enabled sex workers to learn that the fight is on and is continuing with added vigor and strength. The COVID-19 pandemic hugely affected sex workers. While sex work was greatly impacted, sex workers learnt to take help from the collectives that they were associated with without fear of discrimination.

Many sex workers belong to the lower strata of society. They are identified by their class, caste, convictions, and customs. Sex workers belonging to different castes, creed, and religions faced discrimination. Sex workers CBOs, not restricted by any of these issues, were able to provide aid (dry rations, baby food, and milk) to their members and to other people in their neighborhood. The COVID-19 pandemic offered them an opportunity to fight the social evils of stigma and discrimination, to earn back their respect, and a rightful place in society.

The government's announcement of providing dry rations to the poor was a welcome move but was not much help for sex workers as many did not have ration cards. As per the demand of the sex workers collectives, the Supreme Court of India directed all the states and union territories to provide them with dry rations without insisting on any proof. These are important battles won, where the sex workers collectives fought for dignity and financial help during the pandemic and were recognized by the highest court of India.

With the growing numbers of COVID-19 cases across the country, sex workers were increasingly faced with limited options for fighting the pandemic. Finding work in these troubled times was posing risks to their own health and safety. Many of their peers were getting infected, and the situation did not seem to be getting back to normal any time soon. Sex workers began to find ways to keep themselves engaged. They began to organize their own responses to the crisis. They continuously strove

to be a part of the mainstream, not just to fight for their rightful place and to be heard, but more importantly, to extend their support to all who needed it. It was their camaraderie which needs to be celebrated.

One of the successes of HIV was the fight against myths and misconceptions. COVID-19 brought the need for effective communication to the fore again. Self-protection measures needed to go beyond mandatory masks, hand washing, and physical distancing. These are important no doubt, but it was also imperative to develop strategies for sex workers to minimize harm while providing sexual services. Health is paramount for all to survive and so is employment. The need of the hour is to balance the two. Effective communications need to be disseminated to all.

Mental health issues, of critical importance, needed to be addressed in a scientific manner. Newer counseling techniques had to be learnt. A committed pool of workers needed to be trained.

When unlock measures were announced, the businesses of sex workers never went back to normal. Some found ways to cope like shopkeepers putting up barricades to maintain distance. Others insisted on digital payments instead of cash. Still others moved to the digital space like teachers, doctors, and consultants. Sex work, by its very nature, demands physical proximity not physical distancing. Sex workers had to innovate to find ways to work. Despite all these hardships, sex workers as a community looked after and fought for one another. Their resilient spirit needs to be celebrated. In response, many individuals, organizations, and student communities came forward to donate money. In some cases, community organizations provided direct cash transfers to sex workers. In other locations, CBO members advocated successfully with local politicians, district administration officials, private companies with corporate social responsibility (CSR), and philanthropists. Along with food, it was imperative to hand over small amounts of cash to enable sex workers to purchase essential items.

It is important to understand that sex workers, one of the most marginalized communities, were one of the worst hit by the pandemic. While the fight to prevent COVID-19 continues, the fight that sex workers are fighting is also far from over. The stories of their lives and resilience are indeed inspiring. They teach us about self-respect, self-worth, dignity, and the passion to fight back and emerge victorious.

Figure 15.1 shows some reports on sex workers that were published in print media during the pandemic (Fig. 15.1).
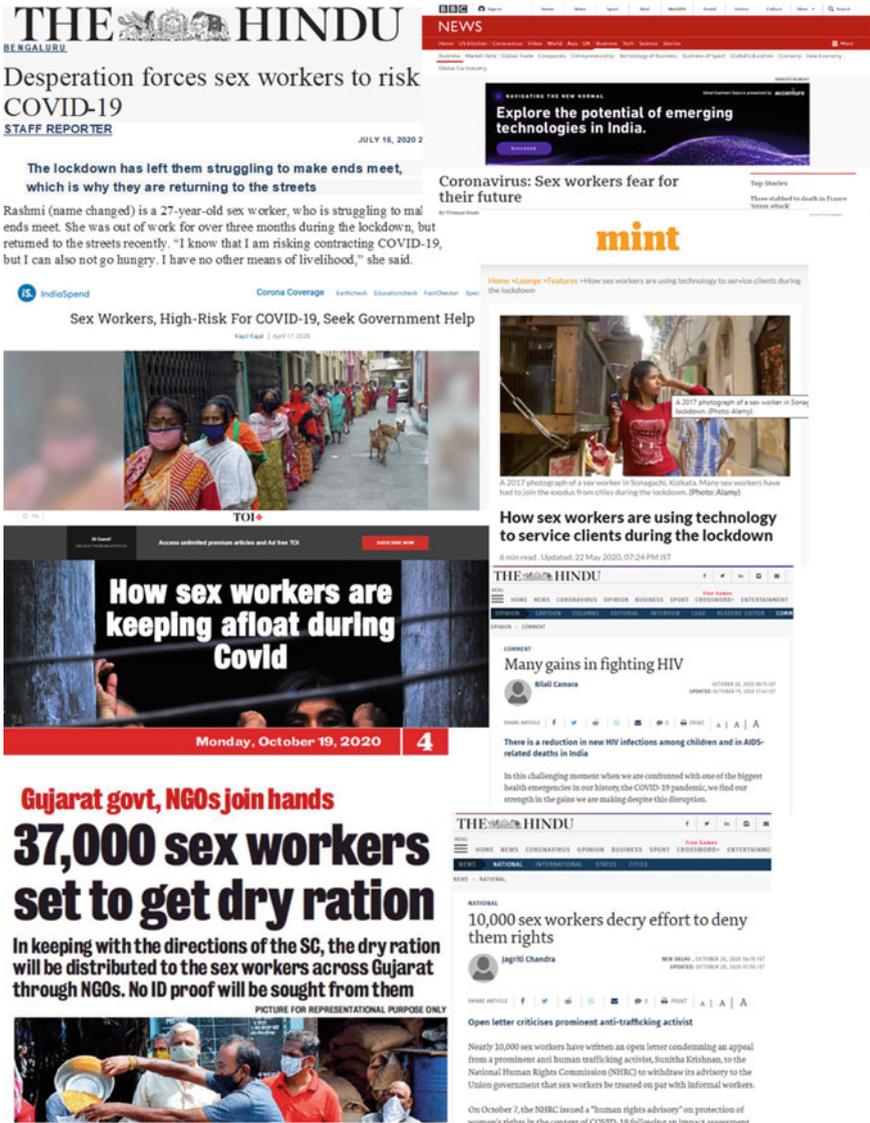
Fig. 15.1 Reports on sex workers during the COVID-19 pandemic in Indian newspapers

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Part IV
Changing Role of Media
and Communications in the COVID-Era

Chapter 16
Communicating COVID: Learnings and Way Forward

Check for updates

Nandita Suneja and Kaushik Bose

Abstract The authors underscore the importance of five key components of a successful pandemic communication strategy—trust, timeliness, transparency, public, and planning. The rapid dissemination of information in social media and other digital platforms has led to an overabundance of information about COVID-19 and much of it is false. This has been termed by the World Health Organization (WHO) as an 'infodemic'. Misinformation and disinformation about the origins of the pandemic, how it spread, and how it can be contained, have impacted efforts to save lives. However, several international and national organizations have successfully countered these messages by using low-tech and high-tech technologies to build trust and encourage compliance with public health measures.

Drawing on past experiences with previous pandemics, the authors discuss how communication strategies have been refined over time. Examples are provided of the impact of misinformation and dissemination on the pandemic in different countries. The experiences of countries around the world and the Indian experience are analyzed. Based on learnings with various communication approaches, the authors make recommendations for future crises: trust the science, identify credible spokespersons, consistently relay and leverage technologies, invest in digital literacy, sustain media engagement, and build intersectoral cooperation.

Introduction

As of early December 2020, the world had seen about 66 million confirmed cases of COVID-19 with over 1.5 million deaths. One-third of these deaths, about half a million, were reported in just two months, October and November [1]. With several countries battling second and third waves of the infection, the worst is far from over. The year 2020 has been, by far, one of the toughest times recorded in history, in terms of human loss and social and economic disruption. It has also been a year of tremendous learning.

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Scientists have scrambled to understand the nature of the virus and have relayed new knowledge in real time. In the absence of a therapeutic breakthrough, non-pharmaceutical interventions and health-promoting behaviors are the only means of preventing infection. Therefore, communicating the science to the public to reinforce COVID-preventing behaviors has proven to be as critical as the research and development of therapies and vaccines.

The COVID-19 pandemic has made it evident that public health communication is an indispensable part of our response for mitigating the ongoing global challenge. International agencies at the forefront of the pandemic response realized the role of COVID communications early on and have actively incorporated this into their strategy. In May 2020, the United Nations campaign 'Verified' was underpinned by the belief that 'Good Communication Saves Lives' [2].

Health communications have been defined as the study and practice of communications strategies that inform, influence, and empower individuals and communities to make decisions that promote health. But what is 'good communication' in public health? As a communications firm with over 10 years' experience in public health, policy analysis, and advocacy, Global Health Strategies (GHS) believes that effective communication is about informing and empowering communities to make healthier choices. With a presence in the US, UK, Brazil, Africa, and Asia, GHS works with government and non-government partners, media, and the private sector on a wide range of issues including infectious diseases, women and girls' health, non-communicable diseases, universal health coverage, emerging diseases, and research and development. Communicating the science to different audiences and bridging the gap between technical experts and the public at large is an area of expertise. Some of the successful GHS campaigns that have helped shape public discourse and move the policy needle in line with evidence include *'TB Haarega Desh Jeetega'* (TB will lose and the country will win) in India and '*My Body, My Choice*' in India and South Africa. GHS's work showcases two critical pillars of health communications: behavior change and the need for a two-way dialogue between those giving and those receiving information.

Based on its expertise and experience, GHS is providing strategic and tactical COVID communications support to partners across the globe. GHS's UK office is working with the Director-General of the World Health Organization (WHO) to contribute to the centralized response from Geneva. At country level, GHS offices in Kenya and South Africa are supporting regional partners and the governments to combat misinformation by creating and disseminating accurate, evidence-based messaging. And in India, GHS is a key communications partner to the country's top scientific body, the Indian Council of Medical Research (ICMR), and supports the WHO in crafting messages for COVID-appropriate behaviors. Over the years, GHS has built the capacity of scientists at ICMR to communicate with stakeholders, specifically focusing on crisis and risk communications. With learnings from this capacity-building and GHS's regular communication support, ICMR has been leading the COVID-19 communications response in India. ICMR has been communicating with the media through regular press interactions and advisories. It has also used digital

and social media to proactively communicate its research and updates on India's COVID response.

A partner in national immunization programs, GHS has extensive experience in promoting the use of life-saving vaccines by creating a communication narrative based on facts. Through its work, it has been able to build the government's confidence in implementing key policy decisions and has advanced the case for the pentavalent and rotavirus vaccines by creating an enabling environment for vaccine discussions grounded in evidence and science. As countries begin rolling out COVID vaccines, GHS will support partners in building vaccine confidence by dispelling misinformation that may arise in an age of growing vaccine hesitancy.

In this chapter, we outline key communication principles, how effective, fact-based communications have helped the overall COVID response, and some of the roadblocks and key learnings that have emerged. Some of these learnings are crucial for informing future communication strategies, not just for outbreak management but for public health programs at large.

Health Communications: Overview and Key Strategies

Health communications emerged as a distinct area of study in the late twentieth century. In the early 1990s, the US Centers for Disease Control and Prevention (CDC) started taking steps to integrate communications in its approach for disease prevention. An office on communications was established in 1996 [3]. Health communications started being included within academic programs as a part of public health curriculae and began to be offered as a formal degree program. This prominence was the result of an evolving view of public health and a growing understanding of its interdisciplinary nature.

The interconnectedness between individual health, environmental factors, human behavior, and community well-being has gained wide understanding in the last three decades. There is increasing recognition of the impact of different determinants on a population's health—including climate change, emerging environmental threats, risk-taking behaviors, food habits, sociopolitical conditions, and economic status, to name a few. At the same time, there has been a shift in public health policy toward prioritizing health prevention and promotion over curative care. Health communications have been a key element in this approach, helping to inform audiences, create awareness, influence perceptions, shift attitudes, prompt action, and encourage behavior change toward health promotion.

In India, large-scale national health efforts such as polio eradication and the National AIDS Control Program are prime examples where communication and social mobilization were placed at the heart of the response strategy and played an indispensable role in achieving successful outcomes. In a 2009 analysis on polio eradication in India, WHO stated that 'Communication strategies have contributed to such progress at several levels by: mobilizing social networks and leaders, creating political will, increasing knowledge and changing attitudes, ensuring individual and

community-level demand, overcoming gender barriers and resistance to vaccination, and, above all, reaching out to the poorest and the most marginalized. They should continue to play a central role in the final push to eradicate polio [4]'.

In the twenty-first century, a globalized world has had to face the emerging and rapidly increasing threats of outbreaks and pandemics, underscoring the need for urgent programmatic and communication responses. The severe acute respiratory syndrome (SARS) epidemic in 2003 prompted WHO to take a serious look at outbreak communications and best practices. Following the Expert Consultation on Outbreak Communications in 2004, the organization published guidelines in 2005 delineating the most critical components of outbreak communications and acknowledging that 'communication expertise has become as essential to outbreak control as epidemiological training and laboratory analysis [5]'.

The WHO guidance identified Trust, Timeliness, Transparency, Public, and Planning as the most important features of a successful outbreak or risk communication strategy. And these features continue to be at the center of current response strategies.

Trust

Communicating with the public in a way that builds and maintains trust is a critical first step. Trust between the public and outbreak managers works in both directions. The public's belief in the information coming from experts and in turn the experts' faith in the public's ability to absorb and accept this information are both equally crucial irrespective of the setting.

Timeliness

Given the time-sensitive nature of an epidemic or outbreak, urgency in communication is of prime importance. Delays in acknowledgment and announcement of an outbreak run the risk of losing trust and endangering compliance of the public to a preventive protocol.

Transparency

Greater transparency helps maintain trust. Ensuring that the public is privy, not just to information but also has a clear view of the decision-making processes, is key to ensuring this.

Public

Understanding the public's beliefs, concerns and perceptions, and including their representation in the decision-making process are important ways of ensuring that the population is placed at the center of communication strategies.

Planning

Finally, factoring risk communication into the overall pandemic preparedness plan is an important part of an effective and comprehensive response.

What We Have Learnt from the Past

These five key principles have continued to guide health communications up to the present crisis. Earlier pandemics—some of which, like HIV, are ongoing—have underscored the challenges of communicating within this framework and provide important lessons for our current moment. One primary hurdle that can have grave public health consequences is the difficulty of separating truth from falsehood. Confusion about what is true and what is false can undermine confidence in health experts and hamper control efforts.

In the early days of the HIV epidemic, conspiracy theories around the virus resulted in many refusing the use of anti-viral therapies in South Africa [6]. In the case of the Ebola epidemic in Western Africa in 2014, misinformation that spread around the cause and transmission of the disease, primarily through social media channels such as Facebook and Twitter, severely impeded emergency responses. In Nigeria, several patients were hospitalized and two died while trying out harmful 'cures' for Ebola, prompting Nigerian ministers to repeatedly issue statements to refute the myths [6].

The underlying issue was that of trust—many locals mistrusted state authorities and the information they circulated. There was also general distrust of 'Western' doctors and humanitarian organizations. It was quickly realized that in order to reach the public, the authorities had to use voices and channels it trusted. Organizations such as WHO and the CDC began enlisting local champions to dispel misinformation, translates information in local languages. In Liberia, music videos by a popular rapper, outlining methods of transmission of Ebola, went viral on YouTube. And the audiovisual form of communication ensured that accurate information reached those who could not read [6].

Similarly, in India, when rumors around the oral polio vaccine (OPV) threatened the polio elimination initiative, specifically in religious minority communities,

training institutions and influential religious leaders were engaged to deliver accurate information to the public by building credibility and trust in the program. A UNICEF report showed that engaging religious leaders in western Uttar Pradesh led to a significant drop—from 5 to 0%—in Muslim children who did not receive the vaccine in 2004 [4].

In 2005, an evaluation of communication strategies around polio eradication in Pakistan showed that while mass media certainly contributed to raising the public discourse around the issue, it often did not reach a core demographic: women [4]. While males continued to be influential in the community, the primary decision-maker about a child's health was most often the mother. Therefore, groups of trained female health workers were engaged to speak directly to the women and to also administer the vaccine. This helped circumvent the cultural barriers of all—male vaccination teams—who could rarely have a direct interface with the women in the community. It also significantly improved trust and built awareness among the public.

Understanding the public and its sociocultural environment has proven key to gaining the public's cooperation. For example, to battle consistent mistrust of health workers in Guinea during the Ebola epidemic, experts recruited a team of anthropologists to analyze the situation and improve cooperation of the community [7]. The team found that messaging around the epidemic had till then focused on biomedical factors alone, without taking into account sociocultural norms. Making minor changes, such as replacing the term 'isolation center' with 'treatment center', helped reduce fear and stigma in the community, as did adjusting the health safety protocol to take into account local beliefs and customs, such as burial rites.

During the SARS epidemic of 2003, timeliness became the most critical aspect for determining the success of risk communications. In Taiwan, a breakdown of communication between the public and the government in the early days of the epidemic, stemming from a shortage of masks fueled by a sudden increased demand, led to a significant backlash. Responding to criticism, the government initiated one of the strictest quarantine strategies in the world at the time—resulting in a further breakdown of cooperation between the public and the authorities [8]. The situation only improved after repeated appeals were made by the Minister of Health and other experts via televised addresses. Lessons from this experience led to significant long-term changes in Taiwan's public health communications policy. The country took proactive steps to improve its channels of information dissemination: by setting up a toll-free hotline to inform the public about potential epidemics, increasing access to government databases on infectious diseases to encourage transparency, monitoring rumors, and making inaccurate reportage in the media a punishable offense [8].

These past experiences have helped shape and refine government approaches to risk communication. However, the COVID-19 pandemic has introduced unprecedented challenges that are unique to our current sociopolitical context and information environment. While the cornerstone of an effective risk communication strategy still holds, countries across the world have had to adapt quickly and efficiently to address the continually evolving needs of the COVID-19 pandemic, unlike any other we have seen.

Fighting a Pandemic and an 'Infodemic'

Like any major event in history, disease outbreaks are inextricably linked to the sociocultural environment of the times. COVID-19 has been no exception. It hit the world in a time of political partisanship and growing social divisions, both fueled by an uncontrolled explosion of information, in a digital age. While this proved to be a boon in reducing outreach time and connecting with large numbers of people, this information overload has come with its own set of challenges.

WHO acknowledged this, terming the phenomenon an 'infodemic' and defining it as 'an overabundance of information—some accurate and some not—occurring during an epidemic [9]'. Following the World Health Assembly resolution that managing the infodemic is critical to controlling the pandemic, it convened the First WHO Infodemiology Conference in June 2020 [10]. Experts from different backgrounds convened virtually to ideate and chart a road map. WHO, along with other UN bodies, called upon all member states to promote science-based information and combat misinformation. It also urged social media platforms to respond to the infodemic [11].

While this explosion of information has provided much useful knowledge to the public, it has also been characterized by the spread of a great deal of false information, which can be categorized into two types: misinformation and disinformation. Misinformation is inaccurate, false information that is spread without the intention to mislead. Disinformation, on the other hand, is shared despite knowing it is false, with a mala fide intent to misguide. Both types of false news have spanned all aspects of the pandemic: how it originated, how it spread, how the disease is diagnosed, how it can be cured, and how governments are responding. The fallout of this parallel epidemic of false information—much of it spread via social media, as described below—has been serious, causing untimely deaths, disease spread, displacement, and disruption.

A global study published in The American Journal of Tropical Medicine and Hygiene in October 2020 examined the COVID-19 infodemic and its impact on public health [12]. Over a period of three months, the team of researchers conducting this study scanned and reviewed false information across various sources including fact-checking web sites, Facebook, Twitter, national and international newspapers, television networks, and the WHO and US CDC Web sites. The authors identified 2311 reports related to the infodemic, categorizing 89% of these as rumors, 8 percent as conspiracy theories, and 3% as stigma-related news. The topics ranged from the cause of disease, transmission, mortality, and control interventions to treatment and cure. Most of these originated in India, the US, China, Spain, Indonesia, and Brazil. Barring China, all the countries on the list have had high caseloads and fatality rates. Four of them—India, the US, Brazil, and Spain, are among the eight worst-hit countries bearing the highest disease burden [13].

Misinformation

Some of the most misleading and dangerous rumors around COVID-19 relate to claims of unverified treatments and cures. The US found itself in the grip of one such rumor when at a White House briefing on coronavirus in April 2020, the President suggested injecting a disinfectant into the body to kill the virus [14]. Coming from arguably the most powerful political office in the world, even a wildly speculative claim that chlorine dioxide can kill the virus proved to be a shot in the arm for conspiracy theorists who had been advocating its use to 'treat' cancer, AIDS, and autism. Shady portals selling the chemical gained traction, as did Twitter handles, promoting its benefits. Despite the US Food and Drug Administration (FDA) and CDC issuing several warnings [15] and disputing the claims, the misinformation spread like wildfire and led to the arrest of a person accused of promoting the product [16].

Around the same time, more than 500 people in Iran lost their lives by drinking toxic methanol alcohol reportedly in an attempt to fight coronavirus [17]. The number of Iranian poisoning cases till May was already five times higher than the second-largest methanol outbreak in history [17]. These cases were linked to the incorrect notion being spread that gargling with methanol or consuming it could cure the body of coronavirus.

In India, the emergence of cow urine as an elixir that cures all maladies has become a permanent fixture in the national wellness debate. In the COVID-19 infodemic, it surfaced several times, touting the magical effect of '*gaumutra*', or cow urine, in tackling the virus. In March 2020, a fringe Hindu group organized a drinking party in Delhi where believers consumed cups of cow urine [18]. Along similar lines, in April, ten people were taken to the hospital in Andhra Pradesh's Chittoor district, after drinking a concoction made from *datura* (devil's weed) seeds, a locally available weed with toxic properties [19]. The origins of this quack remedy allegedly lay in a viral video promoting the drink as a miracle cure for COVID.

There were ample instances of social media being used to relay misinformed opinions of thought leaders and share unproven treatment remedies. Country leaders hyped the effect of hydroxychloroquine even before it was established that the drug had any impact on COVID-19 [20]. This resulted in the hoarding and stocking of the drug. The drug, which is inexpensive and has previously been used mostly to treat autoimmune conditions, became unavailable for the people who required it for other diseases [21].

Apart from creating serious health hazards, false information also caused major economic and social disruption. Rumor mongering led to panic reactions from vulnerable populations. In India, ambiguity on how long lockdowns would continue led to frantic movement of migrant workers in risky conditions [22]. On April 14, 2020, Prime Minister Modi extended the 21-day lockdown first put in place on March 25. Hours after his announcement, hundreds of migrants started gathering at the Bandra railway station in Mumbai, Maharashtra, defying all norms of social distancing. They were hoping to catch a train back to their villages—except that passenger travel was

grounded throughout the country. Mumbai police had to be called in. They used force to disperse the crowds. The incident led to the arrest of several persons, including a reporter for 'rumor mongering' [23]. Migrants' exodus continued in the country throughout the early months of the pandemic, provoking the Supreme Court to direct the government to ensure 'a daily bulletin through all media avenues to clear the doubts of people within a period of 24 h [24]'. Similarly, fears of inadequate supply of essential products led to panic-buying and shortages of food items and important medical supplies like face masks and sanitizers in many countries [25].

The social repercussions of misinformation have been dire, especially for vulnerable sections of the population. Stigma came to be closely associated with the coronavirus. As the response was evolving, emphasis was being placed on early testing of suspected cases and quarantining infected cases. This gave rise to associated feelings of shame, isolation, guilt, and fear among the general population. Health workers had to bear the sharp brunt of this phenomenon—after initially being venerated as 'corona warriors', doctors, nurses, and other medical staff started facing a backlash from neighbors and communities who saw them as potential virus carriers and spreaders. Several instances of discriminatory behavior, social targeting and ostracization, and even physical assault have been recorded against medical workers across the globe [26]. A similar fate was met by other workers such as aviation staff. Pilots flying stranded citizens to their home countries became targets of similar attacks [27]. In April, the Government of India tightened the law on violence against health workers treating COVID patients, making it a non-bailable offense with a punishment of up to seven years imprisonment [28].

Disinformation

With the scientific community grappling with new and emerging evidence about a novel virus, communication around COVID-19 was bound to get messy. Many rumors and inaccurate reporting were a result of a lack of data from expert sources. But the communications response was also sabotaged by deliberate efforts to vitiate the atmosphere for personal, political, or commercial gains.

One such disinformation campaign was around the origin of the virus. While there is evidence to suggest serious lapses in how China reacted to the emergence of the new virus, conspiracy theorists left no stone unturned to convince the world that this was a case of biological warfare by China against the world [29]. Terms such 'Wuhan Virus' and 'Chinese Virus' found their way into the pandemic lexicon with several news outlets mainstreaming them in their coverage, thereby lending credence to unverified perceptions and triggering a racist backlash against, not just Chinese people, but anyone of East Asian origin [30]. This resulted in vandalism of Asian business establishments, physical attacks on Asian people, racist abuse, and negative propaganda.

A study by the Australia Institute's Center for Responsible Technology published in May 2020 examined the origins and spread of the 'Chinese bioweapon' conspiracy

theory. Analyzing over a million tweets and retweets over 10 days in March 2020, the authors found 30 coordinated clusters promoting this theory. Twenty-eight of these were identified as pro-Trump, QAnon, and/or republican partisan [31].

Among the mushrooming literature on COVID-19 misinformation, several studies analyzing social media content have established a correlation between conservative political views, belief in conspiracy theories, and sharing of fake news [32, 33]. In the US, this was evident as Trump supporters carried out rallies slamming lockdowns and mocking the use of face masks. The interplay between politics, public health, and false information has been a defining feature of COVID, especially in countries like the US, which failed to tackle the spread of the disease at the national level. This politicization was evident in October 2020, when for the first time in its history of two hundred years, the renowned New England Journal of Medicine took an ethical stand against Donald Trump, with a scathing editorial slamming the President's response to coronavirus and calling on the public to use the election to 'render judgment' [34].

The Role of Social Media

The misuse of the information environment for personal or political gain is not a new phenomenon, and the pandemic is symptomatic of this reality of our times. Over the last five years, we have seen the use of misinformation and disinformation, fueled by social media, as a political tool. Various factions across the world, including India, are engaged in an information war, competing for a larger share of the media narrative in an attempt to dominate the discourse and thereby influence public opinion and support [35]. The use of information platforms, especially digital ones, to influence political processes is an emerging challenge that also affects health communications, particularly during a pandemic that has been politicized.

While fake news remains a major threat to societies around the globe even in normal circumstances, in the backdrop of a public health emergency, the largely unregulated world of social media has made the repercussions of such stories nothing less than lethal. From hoax theories about biological warfare and 5G spectrum causing the outbreak to claims about miracle cures, these stories have greatly exacerbated the health crisis, as elaborated above. Building an evidence-based narrative on the outbreak has been one of the toughest challenges for crisis managers.

While bodies like the WHO, health departments, and government agencies incorporated innovative communication tools to leverage digital platforms, the nature of the medium did not always allow the prioritization of facts over myths. Studies in the pre-COVID period have established how fake news spreads exponentially—faster than truth on platforms like Twitter [36]. This has been touted as one of the reasons why social media giants have been less than enthusiastic in responding to demands for a more robust scrutiny of the content they host. But in light of public activism, especially against the backdrop of COVID-19, companies like Twitter and Facebook have altered their policy, placing more value in fact-checking and screening content that contradicts verified public health information [37]. An effort has been made to

work more collaboratively with health organizations in the interest of controlling the pandemic. While these have been important interventions in bridging communication gaps, navigating the information environment has been a continuing challenge.

Responding to the Pandemic Through Communications

As more evidence about the transmission, spread, and treatment for COVID-19 emerged throughout 2020, global and national communication responses also evolved significantly. At the beginning, the novelty of the SARS-CoV-2 virus and the absence of any medical interventions to treat it highlighted the urgency of using non-pharmaceutical interventions—including mask-wearing, social distancing, and hand hygiene—to mitigate the pandemic. The need to promote these interventions on a broad scale has made health communications even more vital.

The Global Response

Global frameworks like International Health Regulations (IHR), set up in response to previous public health crises, guided the early communications. In late December 2019, the WHO country office in China first reported the cluster of viral pneumonia cases to IHR, based on a media report published on the Web site of Wuhan's municipal corporation [38].

Initially, WHO played a central and crucial role in communications around COVID-19 globally relaying information about the risks, surveillance, caseloads, clinical management, and travel advisories. At the country level, governments and public health bodies initiated regular communications about the pandemic when the outbreak spread beyond China's borders. However, even before the outbreak reached other countries, news about the virus had spread internationally, by the Internet and social media. This information influx was more significant than in other recent epidemics such as SARS (2003), H1N1 (2009), and Middle East Respiratory Syndrome (MERS) (2012). As described above, increased penetration of the Internet and accessibility of mass media tools made getting information about the pandemic easier for people sitting in remote corners of the world.

There was one significant problem, however. Due to the novelty of the virus, much of the information being circulated in those early weeks had not been vetted by the scientific community. Limited research data in the age of media in which news spreads at the speed of light made it difficult for governments to communicate quickly and accurately about the pandemic. This gave rise, in many places, to a feeling that leaders and official bodies were not providing information that people needed and wanted, leading them to turn to other, less reliable sources. This dichotomy fueled unease and

led to criticism of the so-called failures of governments and international decision-making bodies to respond effectively. In this environment, half-truths, rumors, and fake news began to sprout and flourish.

As cases began surging in Italy, South Korea, and Iran, governments and public health specialists across the world started communicating regularly, relaying the evidence as it emerged. This is one of the first times in recent history that the highest leadership from countries conducted regular media briefings and played a proactive role in speaking about a public health crisis. Around the same time, WHO ramped up its communications to support countries in dispelling misinformation. The WHO communications strategy included a focus on social media, which was increasingly being used as the primary information source for governments and the public alike [39].

Social and digital media platforms started playing a vital role in communications during the pandemic [40]. Since the disease required physical distancing and people stayed at home, social media also provided people the access and immediacy required to navigate this crisis. News platforms increased their presence on digital and social media, where they could stream information in real time. Various governments, public health bodies, and scientists did the same. As the need for easily understandable data became clear, Johns Hopkins University in the US took the lead in January, quickly creating a dashboard tracking global cases and trends in infection spread. The tracker continues to be the go-to resource for real-time updates for experts and the public worldwide.

Some country leaders used social media and digital media platforms like Zoom, Facebook, Twitter, and others to relay credible information [41]. Behavior change communication activities across the globe are largely been done on social media. Campaigns like WHO's #WearaMask gained traction globally. Similar campaigns by governments in their regional languages also had a significant impact on people. As described above, social media platforms partnered with government agencies and WHO to track fake news around the pandemic and drive its users to portals where correct information is available [42].

One of the critical achievements of the rise in digital media during the COVID-19 pandemic has been the use of tele-medicine as a platform for carrying out essential medical services. Tele-medicine is a service provided remotely to patients for health-related advice, addressing queries, monitoring diseases via a secure connection, and thus, maintaining patient–doctor confidentiality. The COVID-19 pandemic made tele-consultation a necessity, which helped countries build their digital health frameworks and guidelines [43].

Selected Country Responses

As COVID spread across the globe, countries around the world adopted diverse approaches to communicate information around the disease. These responses depended on a wide range of situational, sociocultural, economic, and political

factors, such as the nature and speed of infection in certain geographies, history of public confidence in governments and public health institutions, technological capacity, and resources for communication activities.

Some national responses have been more successful than others. Communication strategies that lack transparency (e.g., China in the initial days of the pandemic) or use contradictory messaging that often flies in the face of scientific evidence (as seen in the UK and US at various points) can lead to loss of public trust in health systems and services that can be difficult to restore. By and large, country-level campaigns that have succeeded in effectively communicating with the public shared some fundamental characteristics: clear, consistent, evidence-based messaging that is communicated in a transparent, relatable way that builds trust while acknowledging human emotion and focusing on people and community, without becoming prescriptive or autocratic. Such messaging can be achieved using both high-tech and low-tech methods as described below.

In low-resource settings such as the Democratic Republic of Congo, where word of mouth continues to be an influential channel of information dissemination, authorities engaged with local community leaders to proactively spread accurate information. Town criers were employed to relay messages around COVID-19 prevention. Based on earlier experiences with Ebola, the government also set up a community feedback system—based on surveys delivered via SMS—to track misinformation circulating among the public and to monitor its spread. A COVID-19 hotline was also set up with support from UNICEF to provide general information about the pandemic [44].

In Vietnam—lauded as one of the countries that have exhibited exceptional leadership in COVID-19 management and response—a similar community-first approach was adopted. The government employed the already existing nationwide system of public loudspeakers to bridge the information gap between the government and the local community [45]. Alongside information on the spread of the infection and the number of cases in the country, officials continuously and effectively shared information through this system about best practices for preventing COVID-19, such as using masks and practicing social distancing. The advantage of this was that not only did this means of information delivery have widespread cultural acceptance, it also helped reach those who had little to no access to technology. The government also enlisted the support of mass organizations such as Women and Youth Unions and Farmers Associations and leveraged their strong networks to help generate awareness in the remotest parts of the country [45].

In Senegal, where Islam is the predominant religion, the government engaged religious leaders to disseminate messaging around COVID-19 prevention, particularly during *Ramadan* [46]. Conversely, countries such as Taiwan and South Korea relied heavily on technology to drive risk communications around COVID-19. In Taiwan, the government extensively used platforms such as Facebook, Instagram, LINE, and Tumblr to disseminate information to the public through the use of chatbots; apps were developed for specific needs such as locating the availability of masks nearby. In South Korea, where over 90% of the population has access to smartphones, information around the pandemic was disseminated through emergency text messaging

systems and real-time contact tracing apps—systems that had been set up after the MERS-related coronavirus outbreak in the country in 2015 [46].

Research by the University of British Columbia (UBC) Center for the Study of Democratic Institutions analyzing the communication responses of nine countries and two provinces in the times of COVID-19 found that a significant contributory factor for effective risk communications was going beyond simple public health information by paying attention to emotions, storytelling, and the cultivation of values [46]. An exemplary approach was taken by the New Zealand Prime Minister Jacinda Ardern, who used video-streaming platforms such as Instagram and Facebook to build an immediate and personal connection with the public. She answered public questions directly, which went a long way in building trust. Her podcast and conversations on COVID-19 featured guests from various sections of society, encouraging them to share their stories of the pandemic, gathering feedback and advice [47]. This two-way, open, and transparent means of communication focused on human stories that reinforced the belief that 'we're all in this together' was instrumental in New Zealand's swift and effective management of the pandemic. Messaging around risk communication in New Zealand emphasized ideas of teamwork and social responsibility. The government also set up a nationwide mental health campaign 'Getting Through Together' that provided resources for citizens' mental well-being.

The Indian Response

In India, communication around the pandemic was primarily through government institutions such as the Ministry of Health and Family Welfare and the ICMR via regular press briefings and press releases. Prime Minister Narendra Modi reached out directly to the public, appealing to their emotions and seeking community participation. Sharing of data and responding to questions were left to the Ministry and ICMR spokespersons. Prime Minister Modi's messaging focused on solidarity and people's participation. He termed the COVID-19 response as a '*Jan Andolan*' (people's revolution) unleashing the hashtag #Unite2FightCorona on social media. Particular emphasis was given to thanking 'COVID Warriors'—frontline health workers, doctors, and public health personnel at the helm of the pandemic response. The government set up a dedicated portal for documenting organization-wide lists of frontline workers and encouraged citizen volunteers to share their stories of fighting the pandemic [48]. Leveraging the increased smartphone penetration in India in the last decade, the government also launched a mobile app in multiple regional languages, named *Arogya Setu*, to enable Bluetooth-based contact tracing, map hot spots, and disseminate key information around COVID-19. The app logged in over 100 million users, the largest user base for similar apps in the world. Following criticism around non-transparency and potential privacy concerns, the app was made open source in May 2020 [49].

Learnings for the Future

Health communications will continue to play an equally critical role at later stages of COVID-19 as it did in the beginning. Even though the worst may not be over, it is an opportune time to review the lessons learnt so far. Apart from 2020, our learnings can also draw inspiration from past challenges faced by climate change activists and vaccine advocates who have been battling the different elements of an infodemic for years—from politically motivated conspiracy theories to rumors, hearsay, and mala fide propaganda. Their journey has not been very different from those who faced similar challenges in relaying factual information on COVID-19.

The following are some lessons learned through past experiences:

First, the role of clear and transparent communications and guidelines from governments and leaders on their response strategy and what would be asked of citizens if infection rates increase cannot be underscored enough. New Zealand's Prime Minister's response to the pandemic was bold and engendered massive public support. Her strong leadership and effective communications meant that people knew in advance what would be required of them—and they accepted the challenge.

Second, with countries facing second and third waves of infection, pandemic control interventions need to be sustained and require a continuous dissemination of information to promote healthy behaviors. A critical learning is that irreplaceable position of trust and timeliness of relaying accurate information to everyone is important. As we have seen across countries, strategies such as engaging credible and reliable champions, religious and local leaders, and healthcare workers implementing creative public health campaigns to disseminate evidence-based messages and information through traditional and digital media platforms have effectively combatted misinformation, educated communities about healthy behaviors, and enabled the crucial exchange of information.

Third, with the rollout of the COVID-19 vaccine, ensuring that we are equipped to deal with vaccine hesitancy becomes even more critical. In recent times, the rapid spread of misinformation is threatening vaccination programs worldwide. History shows that once public trust in vaccines has been compromised, it is difficult to win it back [50]. This can set in motion a domino effect that not only slows down the response to the pandemic but also refuels a vaccine-hesitancy movement leading to dangerous resurgence of diseases such as measles that were once largely contained. As vaccines and therapeutics across the world start to show results, it is imperative to support this first-of-its-kind rollout and ensure that misinformation about the vaccines' safety and efficacy is consistently countered. While vaccine hesitancy is localized and context-specific and there is no one-size-fits-all approach, communicating the science of vaccines effectively, through trusted champions and advocates, will build confidence and mobilize governments and communities to make effective policy decisions.

Finally, in an age of emerging environmental threats, this is hardly the last pandemic of our times and, therefore, our learnings must extend to future preparedness. Indeed, technology has advanced and will continue to advance exponentially

in the years to come. From the COVID-19 response, it is evident that artificial intelligence, robotics, and several other technological innovations are helping governments to manage and fight this global public health emergency. We need to continue to invest in such technologies in order to be better prepared for the next challenge.

Recommendations

Based on these learnings and GHS's own experience in health communications, we would like to conclude with a set of recommendations to deal with future crises:

Trust the Science

There is evidence that countries that began deferring to scientific counsel early in the outbreak could flatten the curve before others. In a global survey, 25,307 academics and researchers were asked if, in their opinion, scientific advice had guided their country's COVID response. Researchers from New Zealand were most satisfied, while US experts rated their country's adherence to science dismally low [51].

Identify Credible Spokespersons

Taking an informed decision on the ideal candidate(s) to communicate with the public is an important task. While in some countries, this may be the head of the state, in others, it could be the chief scientific officer. A good spokesperson is one the public trusts and who can mobilize communities toward health-seeking behavior.

Be Consistent in Relaying Messages

A message is of value only once absorbed by the audience. It is crucial for outbreak managers and spokespersons to be consistent and frequent in their messaging, repeating, and reinforcing facts regularly.

Leverage Technology

To counter pandemic fatigue, it is important to keep innovating on how information is being shared. Harnessing the power of telecommunications and information

technology, there is scope to create messages and build databases for local or global consumption.

Invest in Digital Literacy

While smartphone penetration has opened doors to an influx of information, the tools to discern facts have not been developed fast enough. Fact-checking web sites have mushroomed to dispel misinformation on COVID, but it is essential to adopt a proactive, rather than reactive approach to counter fake news. While universities and media houses have set up fact-checking initiatives, there is need for a larger government-level push to create a culture of critical thinking and digital literacy.

Sustain Media Engagement

Consistent media engagement by decision-makers is important. They must find ways to sustain media's interest by sharing new information and developments consistently.

Build Inter-Sectoral Cooperation

Just as a health crisis knows no borders, similarly the communication response must take into account the role of diverse stakeholders. A coordinated response that includes international bodies, governments, research institutions, social media firms, and other private sector entities is integral to achieving results.

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Chapter 17
Relevance of Social and Behavior Change and Communications in the Media on COVID-19 Response

Sanghamitra Singh, Poonam Muttreja, Dipa Nag Chowdhary, and Mandira Kalra Kalaan

Abstract The important role of social and behavior change and communication strategies in the prevention of infection is discussed. These strategies have two complementary, albeit distinct roles: 1) educate citizens on the health risks of COVID-19; and 2) promote desired behaviors to prevent infection.

The authors underscore that messages for the prevention of COVID-19 should be clear and consistent and should be based on scientific evidence. These messages need to be reinforced to promote positive behavior change. They should be empathetic and inclusive and should counter misinformation and fake news. Government of India's citizen engagement platform 'MyGov' has rolled-out a series of campaigns for the prevention of COVID-19. Civil society organizations have complemented the official campaign. The Population Foundation of India developed the *Corona Ki Adalat* (The court of corona) animation series to disseminate key messages and reinforce a sense of solidarity around the fight against COVID-19.

India (and the world) has, for the first time, witnessed an amalgamation of science and mainstream media. The collaboration of the media and public health workers and doctors has been commendable. The authors illustrate this with examples of personalities who stepped-up and gave their time to the media to convey important messages to the public. The last few months have truly witnessed the power of the media and behavior change communications. Until a vaccine becomes widely available, the only way to protect people from COVID-19 and to minimize the burden it places on the public health system is to promote widespread behavior change. And this can only happen through the collaborative efforts of the government, media, public health experts, and civil society organizations.

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Introduction

Since March 2020, the COVID-19 pandemic has brought about a transformative change around the world. While much of the scientific discussions, debates, and research are centered on strengthening health systems and developing therapeutics and vaccines, health authorities, scientists, and political leaders have continuously reiterated the importance of providing information on basic health and hygiene in combating the pandemic.

Stringent efforts by governments can help in the immediate adoption of personal protective measures. But these can only be sustained in the long run by bringing about lasting behavior change. There is an urgent need to undertake effective social and behavior change communication (SBCC) which is key to saving lives.

In the case of COVID-19, SBCC strategies must achieve two complementary, albeit distinct goals: (1) educate citizens on the health risks of COVID-19; and (2) promote desired behaviors to prevent infection. Effective SBCC cannot only help contain COVID-19 but can also help mitigate the adverse consequences of future pandemics.

Lessons from Past Health Interventions in Changing Behaviors

There is a broad global consensus on the behaviors required to reduce the risk of contracting or transmitting COVID-19 [1]. These include maintaining physical distance, washing hands frequently, and wearing masks that cover the nose and mouth, in public spaces.

The adoption of these measures has varied widely across nations. People in East Asian and South-East Asian countries have generally been more accepting of physical distancing and face mask mandates. In these countries, communications from public health officials and political leadership were clear and consistent, reducing confusion and bolstering trust and transparency. In fact, face masks are nearly universal in public spaces in Japan even though the country never issued a mandate to wear them.

There is evidence to suggest that although many measures were implemented for the containment and treatment of Ebola during the outbreak in West Africa in 2014, they were not well integrated within strategies for social and behavioral change during the early stages [2]. Responsive organizations tried to increase the level of threat so that people would take preventive actions by putting out messages that mostly increased fear. This resulted in people not wanting to go to Ebola treatment centers, which, in turn, increased infection transmission and subsequent deaths. During the course of the Ebola outbreak, it became clear that it is important to give people practical and doable steps that they can take to protect themselves, their families, and communities, while believing that the benefits of those actions can increase their confidence and enable them to take control of the situation.

Positive reinforcement of key messages across multiple media is particularly effective in transforming behaviors as has been witnessed from the evaluation findings of the Population Foundation of India's SBCC initiative *Main Kuch Bhi Kar Sakti Hoon* (I, a woman, can achieve anything) [3]. Across three seasons, this transmedia initiative demonstrated the effectiveness of a 360-degree communication approach in changing behaviors. The amplification and reinforcement of the same key health messages were targeted through complementary channels, such as television, radio, interactive voice response system, and digital platforms, along with community mobilization and outreach. This strategy could be useful in the COVID-19 scenario given that while young people generally prefer SBCC messaging delivered through social media such as Facebook and YouTube, most adults are informed through television, newspapers, and radio.

Behavior Change Efforts in Response to COVID-19

A positive communication strategy which focuses on inspiring people to adopt healthy behaviors as well as to become agents of change has greater potential to succeed. There is enough evidence to suggest that people are more likely to adopt healthy behaviors when they observe their peers doing the same. In contrast, a communication strategy based on negative messaging and intimidation can backfire by enhancing societal fear and anxiety.

However, only providing people with accurate information does not automatically translate into the adoption of desired behaviors. There needs to be a better understanding of people's own perception of risk in assessing how susceptible they think they are of getting the disease and the perception of their likelihood of transmitting the disease to others. Furthermore, messaging must be followed up by real interventions designed to change behaviors of the community. Some examples in the case of COVID-19 include placing alcohol-based hand sanitizers at visible locations or using chalk or paint to demarcate six feet physical distancing measures in markets, train stations, and other crowded locations. Behavior change that motivates people to transition to self-efficacy, where individuals are confident of their ability and skills to perform those behaviors habitually, represents the motivational phase of SBCC.

With the spread of the pandemic, misinformation and misconceptions surrounding COVID-19 have been increasing. Even as many turn to the internet and social media for information, there has been a veritable explosion of false and misleading posts, resulting in anxiety and frenzy surrounding the infection. Effective SBCC for COVID-19 requires an active counter-response to dispel these myths and misconceptions.

The uncertainty around COVID-19 messaging is further complicated by the fact that the virus causing it is a new pathogen, and knowledge about the effects of the disease, its transmission, and treatment is continuously evolving. For example, confirmation that COVID-19 can be transmitted by asymptomatic carriers of the disease and that transmission is primarily air-borne required a quick pivot to the

recommendation for universal masking. Again, the fact that COVID-19 is more lethal in the elderly and those with co-morbidities required clear communications of this new evidence.

SBCC messaging on COVID-19 must be empathetic and considerate. For example, how do we recommend hand-washing to those who have inadequate access to water and sanitation? How do we motivate communities who live in crowded houses in slums to physically distance? Effective SBCC should be participatory and inclusive so that it reaches out to vulnerable populations and develops a response that takes the local context into consideration.

How effectively governments communicate the messages to fight COVID-19 will determine when and how normalcy resumes. Since March 2020, the Indian government has endeavored to provide information through SBCC campaigns on COVID-19 to its citizens. *Aarogya Setu, a* mobile app of the Indian government, provides information on the pandemic to the public. It also provides them with advisories. The government also introduced a multilingual COVID-19-related advisory as the default telephone caller tune, demonstrating practical application of SBCC. Government of India's citizens' engagement platform MyGov rolled out a series of campaigns on preventive measures pertaining to COVID-19.

Civil society organizations have complemented the official SBCC campaigns. For example, the Population Foundation of India was the content partner for the MyGov's COVID-19 campaign and supported the Ministry of Health and Family Welfare, Government of India, state governments, and civil society organizations with SBCC materials related to the COVID-19 crisis. Population Foundation of India's messaging strategy included short films and social media creatives on crucial aspects of the disease, based on a clear understanding of the local landscape. Messages were tailored to this context, using local languages and idioms vetted by epidemiologists and public health experts. The issue of stigma was highlighted, and positive messages on kindness and gratitude to healthcare workers and non-discriminatory messages to patients were promoted. Population Foundation of India also developed the *Corona Ki Adalat* (The Court of Corona) animation series that used the familiar setting of a courtroom drama to disseminate key messages, tackle misinformation, and reinforce a sense of solidarity around the fight against COVID-19. The objective was to express gratitude to frontline health workers who had been facing discrimination on account of heightened fear and misinformation about the infection. Population Foundation of India developed a short film on female health workers at the forefront of COVID-19. This video was published on the Government of India's MyGov page and has become one of their top performing posts. It received over 4.6 million hits within 24 hours.

As the country was in various stages of reopening, the Population Foundation of India has launched the *Himmat Hai toh Jeet Hai* (If there is courage, there is victory) campaign to reinforce a sense of unity by highlighting role models who displayed extraordinary courage in the face of challenges. The campaign aims to inspire citizens at this difficult time. The campaign anthem, which depicts the *himmat* (courage) shown by regular people in their everyday lives to overcome the challenges that they face, has reached of over 1.5 million on Facebook alone and has been shared by eminent influencers from the media, sports, and the political field.

Important information on COVID-19 provided by the government captured public attention and also conveyed messages that were reliable and appropriate. It also entailed disseminating messages to target audiences across languages, ages, cultural affiliations, and education levels.

Role of Media in COVID-19 Response

COVID-19 is more than just a science and health story. WHO has warned of an 'infodemic' or the tendency of people and organizations, particularly on social media, to have too much information flowing, often allowing misinformation a free pass. Media has a crucial role to play in empowering people with the right information. Journalists have a tough task at hand with the constant influx of new information and advisories. As research on the virus progresses, a news piece from today may become outdated tomorrow. Public health experts and researchers have been constantly revising their opinions and recommendations in accordance with the emerging information [4].

During such an unprecedented public health and humanitarian crisis, even more than in peace time, media needs to remain steadfast. It should continue to play the role of a provider of credible information, the provider of a forum where discussions are possible allowing for enriching debates, holding public authorities and the government accountable to citizens if it fails, and providing adequate attention to public health. The record of the media in all three areas has been mixed.

Several journalists and representatives from the media have risen to the occasion and made efforts to ensure that the public discourse around COVID-19 remains a priority. Probably for the first time, India (and the world) have witnessed an amalgamation of science and mainstream news reporting. Journalists have been educating themselves constantly to ensure that the science behind COVID-19 does not remain restricted to a select few who have the knowledge and understanding of scientific concepts. Practices such as mask-wearing, hand-washing, and physical distancing, that must be cultivated by the population at large to fight the pandemic, have been greatly promoted by the media. The media has also raised issues around the challenges that people faced at the ground level during the lockdown.

The media promoted an active and continuous discourse on the subject by constantly bringing to the forefront the latest research and developments pertaining to the disease. Scientists and public health researchers, on the other hand, also realized the need for continuous conversations between mainstream media and science. The collaboration of the media and public health workers and doctors has been commendable. Online portals like The Wire, Scroll, and The Print among others and news anchors like Karan Thapar and Barkha Dutt took time out to doggedly capture the changing picture, day in and day out and week after week, through detailed interviews and stories on the science and health dimensions of the crisis, its impact on the economy, and destruction of lives of thousands of urban migrants because of the lockdown.

We witnessed the Chairman of the Public Health Foundation of India, Dr. Srinath Reddy's deployment of cricket metaphors on COVID-19 on a popular television channel. A noted mental health expert Dr. Vikram Patel was able to help cut the noise levels on television and get his points across about the need to recognize and battle mental health problems. The media has been consistently seeking the views of noted and trusted experts like Dr. Randeep Guleria, Director of the All India Institute of Medical Sciences, among others to keep the public informed about the causes of the pandemic and the preventative measures for avoiding contagion. The good work to disseminate information that public health professionals have done is hard to measure. Professionals in the private sector have also been forthcoming, in giving time to the media to help educate people and to dispel the myths around COVID-19. Professionals like Dr. Naresh Trehan, Ms. Kiran Mazumdar-Shaw, and Dr. Sangeeta Pratap, to name a few, stepped up and enriched the discourse.

There have been disappointments too, and these should serve as learnings for the future. There were times when the media allowed what should have been a laser-like focus on COVID-19, to slip and be hijacked by divisive and disproportionate coverage of the gathering at the *Tablighi Jamaat* headquarters in New Delhi, or the matter of the unfortunate death of a young actor in Mumbai. The authorities, by initially singling out the *Tablighi Jamaat* congregation as the main source of the spread of the virus erred, in our opinion as that could have stigmatized certain communities and groups. But we must recognize that they were quick to recant and drop the classification when it became clear that it was a red herring. There has been a view that media did not question public authorities enough for their inability to provide for citizens or for not thinking through the consequences before announcing lockdowns. But by and large, media personnel, despite the fear of the disease, job losses that haunted the sector, and the stringent lockdown conditions they encountered, did manage to get the news out and prioritized public health during this unprecedented crisis.

Concluding Comments

COVID-19 is the most significant public health challenge the world has faced in our lifetimes. With every passing day, we are coming to terms with the extent of its impact, the nature of infection transmission, preventive measures, and treatment that could be most effective. The longer-term impact of COVID-19 is still not fully comprehended, but from what we know so far, the disease is going to be a part of our lives in the near-term. Much of what we do and say today will influence and shape how the pandemic will impact us in the long run.

In the past few months, we have truly witnessed the power of the media and SBCC. Even if the media did not always keep up with the challenge, it has created a crucial opportunity to think about promoting health literacy beyond COVID-19. As all public health officials tell us, it is important to prepare for future crises and build the resilience and stamina of the people.

Never before has SBCC been accelerated to the extent that it has been in the wake of the pandemic. It has been a mammoth task to get a country with a population of 1.3 billion to adopt novel practices such as mask-wearing, physical distancing, and maintaining personal hygiene in such a short duration. In the past, large-scale campaigns have failed to inculcate new habits. We have a unique opportunity to align insights from the social and behavioral sciences, epidemiology, and public health to create powerful, meaningful, and sustainable SBCC campaigns. Communication efforts in response to COVID-19 must not be viewed as one issue. They should be seen as a step toward meaningful social change. This will enable people to meet the challenges of future public health crises by respecting scientific solutions with a sense of solidarity among citizens.

Until there is universal availability of the COVID-19 vaccine, the only way to protect people and to minimize the burden it places on public health systems is to promote widespread behavior change. And this will only be possible through a collaborative effort of the government, media, civil society organizations, and public health experts.

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Part V
Experiences of Countries That Have Successfully Contained the Pandemic

Chapter 18
'Go Hard, Go Early': New Zealand's COVID-19 Elimination Strategy

Rashmi Pachauri Rajan

Abstract The author describes how New Zealand successfully eliminated the virus. 'Go ahead, Go early' was New Zealand's moto. Strict border controls and high compliance with lockdown measures proved to be effective in controlling the pandemic.

New Zealand's official campaign 'Unite Against COVID-19', was later changed to 'Unite for Recovery' as the focus shifted from elimination to recovery. It has now changed back to 'Unite for Recovery' and this will remain until the international threat of COVID-19 is eliminated.

The strategy was guided by science and data. The government relied on public health advice and evolving evidence. And, of course, leadership played a crucial role. The Prime Minister was resolute, confident, and pragmatic. The messages she re-iterated at the daily press conferences became catch phrases. Discipline came to the fore. People did not complain. They did not protest. They simply followed the rules, placing utmost trust in their government and its clear communications. Trust in political leaders and health experts was the key reason for the success of the program. And kindness was the *Mantra*!

Amid the gloom and doom that our world is currently battling, God was spotted in New Zealand. Someone asked God 'What are you doing?' 'Working from home, Bro'.

The Timeline of the Virus

'Go hard and go early' has been New Zealand's motto for the elimination of the coronavirus in the country. Combined with strict border controls and high compliance with lockdown measures from 'the team of 5 million', it seems to have worked.

However, since this was written, the Delta Variant in New Zealand emerged in early 2021, and since then there have been surges in a number of regions. The strategy has now changed from elimination to a Covid Protection Framework.

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The first case of COVID-19 in New Zealand was reported on February 28, 2020. As of October 30, 2020, the country has had a total of 1594 confirmed and 356 probable, and to date, 25 people have died from the virus (Appendix 1).

New Zealand closed all its borders and entry ports and required returning nationals to self-isolate on March 19, 2020. After April 10, all returning nationals were sent into managed isolation for a period of two weeks.

A four-level alert level system was introduced on March 21, 2020 to manage the outbreak within New Zealand (Appendix 2). The alert level was first set at Level 2, but was then raised to Level 3 on March 23, 2020. As of March 25, 2020, the alert level was moved to Level 4, putting New Zealand into a nationwide lockdown. The alert level was moved back down to Level 3 on April 27, 2020, partly lifting some lockdown restrictions, and then down to Level 2 on May 13, 2020, lifting the rest of the lockdown restrictions but maintaining physical distancing and gathering size limits. The country moved down to Level 1 on June 8, 2020, removing all remaining restrictions, except border controls.

Then, on August 11, 2020, four cases of COVID-19 from an unknown source were reported in Auckland, breaking the 102-day cycle of zero cases. On August 12, the Auckland Region was put on Alert Level 3, and the rest of the country on Level 2. On August 30, 2020, at 11:59 pm, Auckland moved back to 'Alert Level 2.5', an adapted version of Alert Level 2, but with limitation on public gatherings, funerals, and weddings. On September 23, 2020, at 11:59 pm, Auckland moved back to Alert Level 2, while the rest of the country moved to Alert Level 1 on September 21, 2020, at 11:59 pm [1].

...Prompted the Strategies Applied

On October 18, 2020, one case in the community was discovered and on October 21, 2020, there were two more community cases. Since then, there have been two further cases in the community which have been contained. However, a few cases are coming through the border and are being managed in the government's managed isolation and quarantine facilities. One of the main reasons for the success of the avoidance of an almost second wave has been the government's emphasis on contact tracing. The NZ COVID Tracer is a Ministry of Health app that allows one to create a digital diary of places visited by scanning the official quick response (QR) codes at shops, businesses, and other places. This gives contact tracers a head-start with identifying anyone who may have been exposed to COVID-19 so that the chain of transmission can be quickly broken [2]. By the beginning of September 2020, approximately 2.1 million people had downloaded this app, of which about 50% were New Zealanders above the age of 18 years [3] (Fig. 18.1).

So, what were the key elements of New Zealand's successful COVID-19 strategy? New Zealand's fight to contain the virus followed, by and large, the classic pattern intended by the science of virus transmission. This included stopping the virus from arriving into the country via travelers; securing personal protective equipment to

Fig. 18.1 New Zealand
COVID tracer
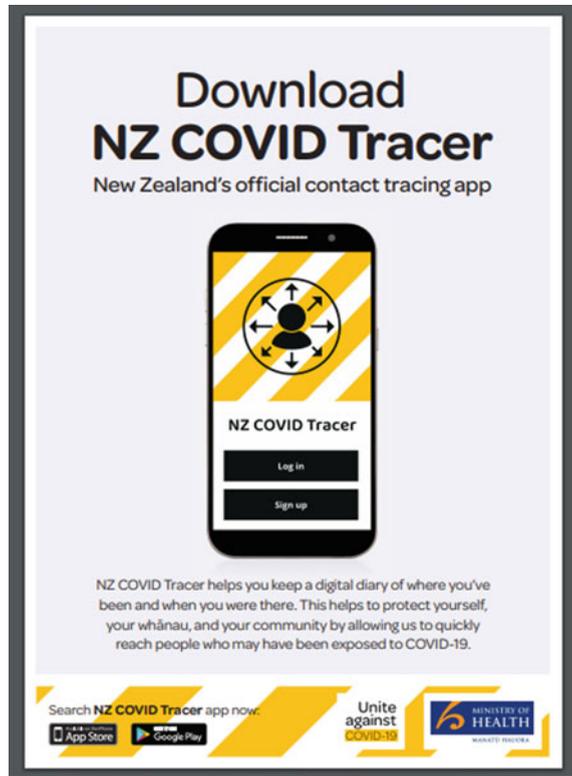
protect essential workers; testing, contact tracing, and isolating those who tested positive; and, most of all, mobilizing the public to lockdown and physically distance in an attempt to slow or break the chain of transmission. And how did New Zealand implement this? (Figs. 18.2 and 18.3).

Travel Restrictions

New Zealand's COVID-19 pandemic response began ominously. Two days after the World Health Organization (WHO) declared the virus a 'Public Health Emergency of International Concern', New Zealand responded by prohibiting the entry of flight passengers who had started in or traveled through China during a 14-day period prior to arrival. Flights from everywhere else continued to be allowed to come in, however, allowing both New Zealand residents and travelers from other countries to enter, provided that they self-isolated for 14 days. It was not till April 9, 2020, that the New Zealand Minister of Health issued an order requiring that all airline or marine passengers entering New Zealand from overseas had to undergo medical testing and

**Fig. 18.2** COVID-19
protect yourself
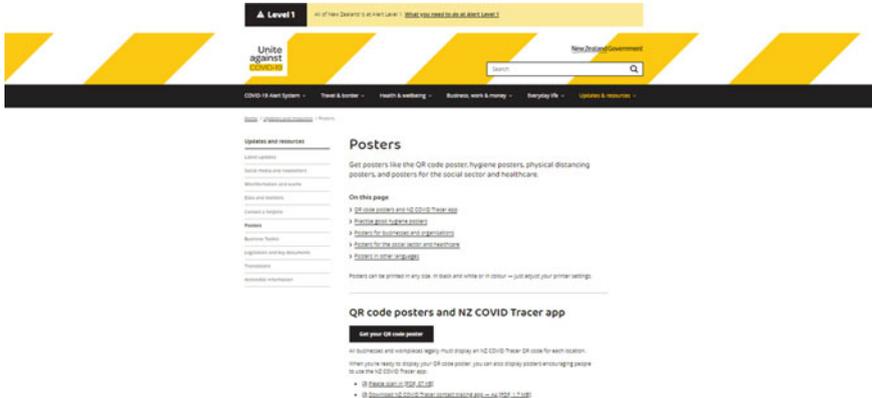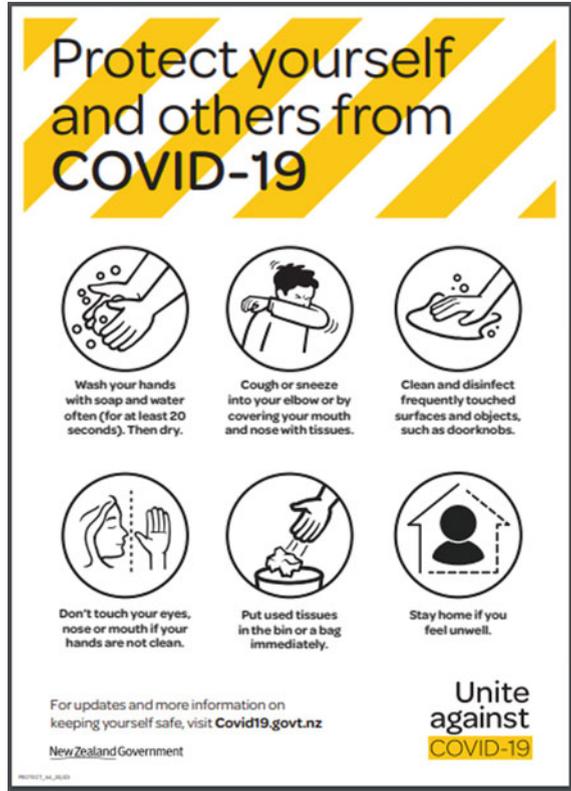
Fig. 18.3 COVID-19 government of New Zealand updates
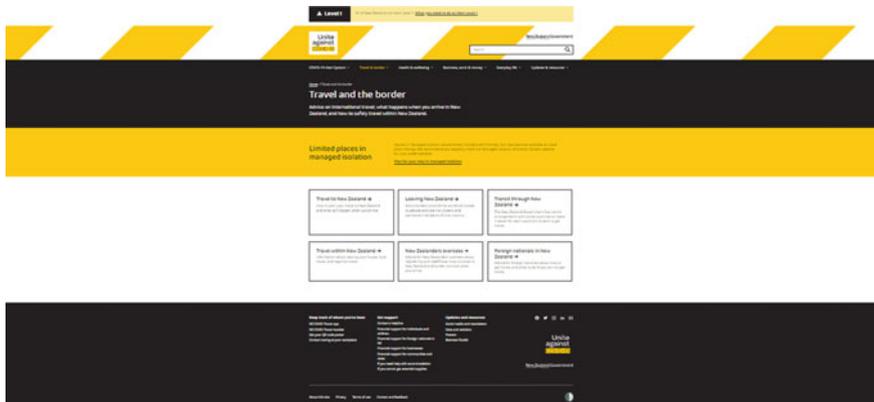
Fig. 18.4 Travel and the border

quarantine in a supervised quarantine facility. However, once that happened, the government stopped the influx of the virus into New Zealand (Fig. 18.4).

Personal Protective Equipment (PPE)

New Zealand also immediately developed a live national register for personal protective equipment to identify Kiwi manufacturers that could help in the fight against the virus by manufacturing all kinds of equipment. Local businesses promptly responded by ramping up domestic production or coordinating with affiliates in China to obtain large supplementary purchases of masks, sterilized gowns, hand sanitizer, and face shields.

Testing

In the area of testing and in a global scramble for scarce supplies, the New Zealand government speedily organized a public–private consortium to acquire test kits and reagents from other suppliers. By the middle of May 2020, New Zealand had conducted more than 100,000 coronavirus tests, at a rate of about 2200 tests per 100,000 people—a figure much higher than either South Korea or the United States achieved during the same period.

Contact Tracing

Once someone has tested positive, standard COVID-19 pandemic protocols entail a concentrated effort to identify and test all those with whom that person came in close contact with over the past 14 days. New Zealand accomplished this through both low- and high-tech methods. The main tracing tool was the Ministry of Health's low-tech method, whereby officials interviewed each person who tested positive to find out whom they had interacted with over the past 14 days. The national government later developed a COVID-19 tracing cell phone application to assist people to retrace their steps when a contact tracer informs them that they have the virus (Figs. 18.5 and 18.6).

Fig. 18.5 Sign-in. Stop the virus. QR code
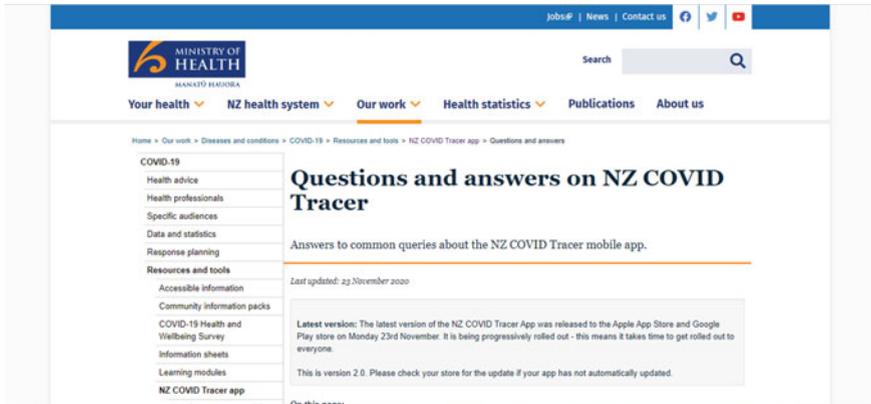
Fig. 18.6   QA on New Zealand COVID tracer

Lockdown

Arguably, the most difficult challenge for any government responding to a novel pandemic threat is that of getting the population to take the threat seriously and change to behavior radically and instantly, to break the chain of virus transmission. With this step, New Zealand's government made history. It put in place very strong restrictions in an effort to not just mitigate, but to eliminate community transmission of the virus [4].

Ongoing through this entire period has been managed isolation of incoming Kiwis. However, as of November 3, 2020, travelers are legally required to have a voucher before flying into New Zealand. Travelers to New Zealand will now need to register on the Managed Isolation Allocation System as the first step to securing their place in managed isolation. Once the individual traveler, couple or family group has completed their registration on the system, they are issued a voucher that confirms their allocation to a place in managed isolation. They need to present their voucher at the airport in order to board their flight. The Managed Isolation Allocation System is for travelers who have the legal right to enter New Zealand. Although there is no fee for getting a voucher, some people are charged for their stay in managed isolation or quarantine [5].

The New Zealand Government's official pandemic campaign was 'Unite Against COVID-19'. The campaign was later changed to 'Unite for Recovery' in mid-June 2020, as New Zealand's focus shifted from elimination to economic recovery, and has now changed back to 'Unite against COVID-19' until the international threat of COVID-19 is eliminated. The Government of New Zealand called on the entire population to unite as a 'team of 5 million' to protect their families, friends, and neighbors (Figs. 18.7 and 18.8).

New Zealand worked on a strategy comprising speed, guided by science and data, and ensuring that at no stage was the guard let down. The Director-General

Fig. 18.7 Unite for the recovery

Fig. 18.8 Unite against COVID-19

of Health, Dr Ashley Bloomfield says the country's strategy is based on speedy testing, contact tracing and isolation, while at the same time rigorously adhering to public health guidance. At every step of the response, the Government of New Zealand was guided by public health advice and evolving evidence, Dr Bloomfield says 'Technical guidance, outbreak updates and risk assessments from WHO played a key role. The International Health Regulations (2005), known as IHR (2005), also provided an invaluable framework for sharing information about the virus and its evolution. New Zealand recognizes the very critical role that WHO plays in public health emergencies and has valued its global and regional leadership and the sharing of information and expertise throughout the response to COVID-19', he adds. 'New Zealand continues to be vigilant', Dr Bloomfield says. 'The Government is rightly cautioning that the virus is still circulating around the world and that New Zealand must work hard to keep it from returning. They must also maintain readiness to reintroduce control measures if it does'.

...Along with the Economic Response

But as has been the case in all countries, strategies have had to balance between protecting the health of citizens and their economic livelihood. New Zealand went 'hard and early' with regard to taking health and related measures. However, alongside, the Prime Minister and the Finance Minister, Grant Robertson also began putting in place a number of economic measures and COVID-19 response packages. The first step was that on March 17, 2020, the New Zealand Government announced an initial $12.1 billion COVID-19 Economic Response Package. This package was expanded as the situation changed. The COVID-19 Economic Response Package allocated $12.1 billion to support New Zealanders and their jobs from the global impact of the pandemic. It included

- Initial $500 million boost for health.
- $5.1 billion in wage subsidies for affected businesses in all sectors and regions, available from March 17, 2020.
- $126 million in COVID-19 leave and self-isolation support.
- $2.8 billion income support package for the most vulnerable, including a permanent $25 per week benefit increase and a doubling of the Winter Energy Payment for 2020.
- $100 million redeployment package.
- $2.8 billion in business tax changes to free up cash flow, including a provisional tax threshold lift, the reinstatement of building depreciation and writing off interest on the late payment of tax.
- $600 million initial aviation support package.

Grant Robertson emphasized that 'this is not a one-off package, it is just the beginning. As we go through this crisis toward economic recovery the government will be constantly monitoring the situation and adjust its response. As with every action we have taken we will be constantly reviewing every measure to ensure it is getting to the people and businesses that need it the most'. And this is exactly the strategy that they followed [6].

Budget 2020, delivered by the Minister of Finance on May 14, 2020, complemented the initial response to COVID-19. In the main, the budget focused on meeting cost pressures and supporting public services to fight and rebuild the economy. The $50 billion COVID-19 Response and Recovery Fund (CRRF) established in the budget supports initiatives from the budget and further measures announced since.

After Budget 2020, $20.2 billion remained in the COVID Response and Recovery Fund (CRRF). Investments made since then include

- extension of the Wage Subsidy Scheme and the COVID-19 Income Relief Payment for those who lost their income as a result of the pandemic.
- extension to the Small Business Cashflow Scheme.
- additional funding for personal protective equipment for healthcare providers.

As at July 20, 2020, $14 billion remained in the COVID-19 Response and Recovery Fund, which was set aside in the event that, for example, New Zealand experiences a second wave of the pandemic. On August 21, 2020, the government announced a new two-week wage subsidy available to businesses that experienced a 40% revenue drop across a 14-day period between August 12, 2020, and September 10, 2020, when compared to a similar period last year [7]. Thus, there has been ongoing economic support to business and organizations in parallel to the health measures taken by the government.

...Backed by Kiwi Ingenuity

And of course, overarching all of this, leadership played a key and crucial role. The Prime Minister, Jacinda Ardern, was resolute and confident, emotional and pragmatic. The messages she reiterated in daily press conferences have turned into catchphrases. 'Stay home'. (in your household bubbles) 'Be kind'. 'We must go hard, and we must go early'. Along with all of this, self-reliance lies at the heart of the country's identity. The view that New Zealanders are most innovative when left to their own devices even has a name here—it is called 'Kiwi ingenuity'.

Physical distancing, lockdowns, masks, Zoom calls, the inability to be with loved ones, and the singular purpose of keeping oneself and others safe have become paramount. How can that leave anyone unchanged! Yet, from behind the sometimes-cold exterior (of what one now knows as stress and anxiety caused by trying to make sense of a rapidly changing world), peaks New Zealand's kind old recognizable face, of concern and helpfulness. Discipline has come to the fore like never before. Kiwis did not complain, they did not protest, and they simply followed rules, placing utmost trust in their government and its clear communications. This trust, which political leaders and health experts were able to cultivate amongst the population, is a key reason for why the results in New Zealand have been so strikingly different from other countries of the developed world. Everything was about collaboration, working together, and positive language—rather than fear. And kindness was and is the *mantra*! All of this and the indomitable Kiwi spirit has put them at the forefront of success in the war against COVID-19. And it is with pride that one is part of this now famous 'Team of Five Million'. In this New Zealand, which one can't but love, one can be one's true self and is encouraged to bring that self to every space one occupies—to work hard and early to defeat even the seemingly most unconquerable of adversaries such as COVID-19. Which is why, amidst the gloom and doom that our world is currently battling, one needs to end on a note of optimism: God was spotted in New Zealand, and someone asked—'What are you doing in Aotearoa, God?' 'Working from home, bro!'

Appendix 1: The COVID-19 Timeline

December 29—2019 Chinese authorities advise the WHO of cases of pneumonia of unknown cause, originating in Wuhan, Hubei province.

January 7, 2020—China isolates a novel coronavirus, at first called 2019-nCoV and later SARS-CoV-2.

January 13—First lab-confirmed case outside China identified, in Thailand.

February 3—New Zealand temporarily bans entry of foreigners from, or who have traveled through, mainland China.

February 12—Disease renamed COVID-19.

February 20—Six New Zealanders enter the quarantine facility after being evacuated to New Zealand by air from the Diamond Princess cruise ship in Japan. Four New Zealanders from the ship were admitted to hospital in Japan with the virus.

February 28—New Zealand's first confirmed case reported to Ministry of Health.

March 4—New Zealand's second confirmed case announced, and then, cases started rising.

March 11—WHO declares the outbreak a pandemic.

March 16—Government bans nonessential outdoor gatherings of 500-plus people; schools and universities exempt.

March 17—Government announces $500 million in funding for health services to combat the disease, as part of $12.1 billion COVID-19 economic package.

March 19 —Government bans indoor events with more than 100 people; exemptions for workplaces, schools, supermarkets, and public transport.

March 19—Nationals were advised not to travel, and those overseas were directed to return to New Zealand.

March 20—Border closed to most foreigners. Exempted categories include essential health workers.

March 21—Alert level system announced. New Zealand is at Level 2.

March 23—Government lifts country to Alert Level 3 and announces widespread restrictions on movement will come into effect at 11.59 pm on March 25 under Alert Level 4.

March 29—New Zealand's first COVID-19 death—a woman in her 70 s in hospital on the West Coast. Sixty-three new confirmed or probable cases. Combined total 514.

April 7—The New Zealand curve is flattened with 65 recoveries and 54 cases.

April 10—Second New Zealand death reported, a woman in her 90 s who died at Burwood Hospital in Christchurch on April 9. Forty-four new confirmed or probable cases. Combined total 1283.

April 11—Two new deaths, bringing the total of deaths to four. Twenty-nine new confirmed or probable cases. Combined total 1312.

April 15—Deaths total remains nine. Twenty new confirmed or probable cases. Combined case total: 1386.

May 4—Normality slowly returns. No new cases. One probable case reclassified as a confirmed case. Combined total remains 1487.

May 9–12—One to three cases a day.

May 13—No new cases. In stages over the coming days, New Zealand moves from Alert Level 3 to 2 from 11.59 pm.

June 8—New Zealand now has no active cases. The last remaining case has been symptom-free for 48 h is regarded as recovered and has been released from isolation.

June 8—New Zealand steps down to Alert Level 1 from 11.59 pm.

June16–July 24—One to three cases a day on average. Combined total: 1556.

Through to August 10—One to three case per day on average. Combined total: 1569.

August 11—Five new confirmed cases. Combined total: 1574. Four of the new cases are in the community, in Auckland, and do not have a known source. It has been 102 days since the last case that was acquired locally from an unknown source.

August 12—Auckland goes into Alert Level 3 lockdown from midday, until midnight on August 14. The rest of New Zealand goes into Level 2 for that period.

Through to September 20—Cases rise and then start declining. Four new confirmed cases. Combined total: 1815.

September 21—New Zealand, except Auckland, moves to Alert Level 1 at 11.59 pm.

October 7—Auckland to come down to Level 1 [8].

Appendix 2: New Zealand's Alert levels

Alert levels are cumulative—each level includes the restrictions of the level below it. The levels are as follows:

Level 1—Prepare

COVID-19 is uncontrolled overseas. The disease is contained in New Zealand, but isolated household transmission could be occurring (Fig. 18.9).

- Border entry measures to minimize risk of importing COVID-19 cases.
- Intensive testing for COVID-19.
- Rapid contact tracing of any positive case.
- People arriving in New Zealand without symptoms of COVID-19 go into a managed isolation facility for at least 14 days.
- People arriving in New Zealand with symptoms of COVID-19 or who test positive after arrival go into a quarantine facility and are unable to leave their room for at least 14 days.
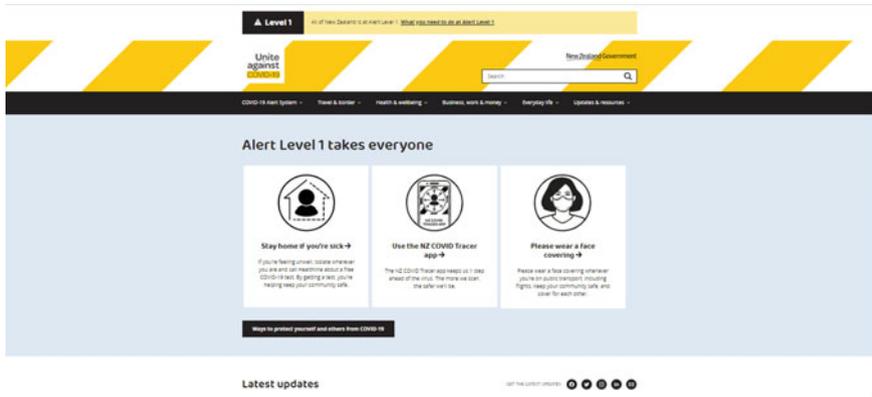
Fig. 18.9 Unite against COVID-19—Alert Level 1

- Mandatory self-isolation may be applied.
- Schools and workplaces open and must operate safely.
- Physical distancing encouraged.
- No restrictions on gatherings.
- Stay home if you are sick, and report flu-like symptoms.
- Wash and dry hands, cough into elbow, and do not touch your face.
- No restrictions on domestic transport—avoid public transport or travel if sick.

Level 2—Reduce

COVID-19 is contained, but the risk of community transmission remains.

People can connect with friends and family, go shopping, or travel domestically, but should follow public health guidance.

- Physical distancing of two meters from people you do not know when out in public is recommended, with one meter physical distancing in controlled environments like workplaces unless other measures are in place.
- No more than 100 people at indoor or outdoor gatherings (subject to any lower limit, e.g., fire regulations).
- Sport and recreation activities are allowed, subject to conditions on gatherings, contact tracing, and—where practical—physical distancing.
- Public venues can open but must comply with public health measures.
- Health and disability care services operate as normally as possible.
- Businesses can open to the public, but must follow public health guidance including in relation to physical distancing and contact tracing. Alternative ways of working encouraged where possible.
- Schools, early childhood education, and tertiary education providers can open with appropriate public health measures in place.
- Those at high risk are advised to take more precautions.

Level 3—Restrict

The disease is not contained. New clusters of cases are to be managed by testing and contact tracing. Community transmission could be there.

- People instructed to stay home in their bubble other than for essential personal movement—including to go to work, school if they have to or for local recreation.
- Physical distancing of two meters outside home (including on public transport) or one meter in controlled environments like schools and workplaces.
- People must stay within their immediate household bubble, but can expand this to reconnect with close family/whānau, or bring in caregivers, or support isolated people. This extended bubble should remain exclusive.
- Schools (years 1–10) and early childhood education centers can safely open, but will have limited capacity. Children should learn at home if possible.
- People must work from home unless that is not possible.
- Businesses can open premises, but cannot physically interact with customers.
- Low risk local recreation activities are allowed.
- Public venues are closed (e.g., libraries, museums, cinemas, food courts, gyms, pools, playgrounds, and markets).
- Gatherings of up to ten people are allowed but only for wedding services, funerals and *tangihanga*. Physical distancing and public health measures must be maintained.
- Healthcare services use virtual, non-contact consultations where possible.
- Inter-regional travel is highly limited (e.g., for essential workers, with limited exemptions for others).
- People at high risk of severe illness (older people and those with existing medical conditions) are encouraged to stay at home where possible and take additional precautions when leaving home. They may choose to work.

Level 4—Eliminate

It is likely the disease is not contained. Community transmission is occurring, and there are widespread outbreaks and new clusters.

- People instructed to stay at home (in their bubble) other than for essential personal movement.
- Safe recreational activity is allowed in local area.
- Travel is severely limited.
- All gatherings canceled, and all public venues closed.
- Businesses closed except for essential services (e.g., supermarkets, pharmacies, clinics, and petrol stations) and lifeline utilities.
- Educational facilities closed.
- Rationing of supplies and requisitioning of facilities possible.
- Reprioritization of healthcare services [9].

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Chapter 19
Learnings from Asia

Saroj Pachauri and Ash Pachauri

Abstract The authors draw learnings from Asia by examining the strategies employed by governments in countries that have successfully contained the pandemic. They study the policies and strategies implemented in Taiwan, South Korea, Vietnam, Singapore, East Timor, and Mongolia, countries that successfully countered the ravages of COVID-19.

The experience of these countries demonstrates the importance of strong leadership in mitigating the pandemic by harnessing the power of rapid response, evidence-based approaches, transparent communication, and partnerships in building a sustainable and successful pandemic response. The leaders of these countries acted decisively in the COVID-19 response with a whole of government approach. The presence of robust public health systems along with national institutions that can act swiftly to prevent the spread of infection was an essential prerequisite for containing the pandemic. The process of enforcing top-down programs was shifted to a multi-stakeholder, participatory approach. Strong and compassionate leadership was undoubtedly the defining trait of nations to navigate time-sensitive issues in today's pandemic era. Their experiences showed that policies that addressed equity issues and were compatible with the cultural context had a more enduring impact. In countries, where large numbers of infections are still being reported, it is time that leaders acknowledge the importance of acting rapidly on the best available evidence, with transparency and responsibility that is particularly critical in low-income, fragile settings.

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Introduction

COVID-19 has seriously impacted a large number of countries globally. The response of different countries to its onslaught has, however, varied. Different responses—epidemiological and political—to the pandemic have resulted in varied consequences. Policies and actions by governments, including their ability to promote the engagement of communities, have impacted outcomes.

Some countries in Asia have successfully contained the epidemic. It is important to study and analyze the measures they employed in order to draw lessons for countries that are still struggling to counter the health and economic impacts of COVID-19. This chapter is focused on drawing the learnings from countries from Asia that have successfully contained the epidemic. These learnings could be adapted by countries that are in the throes of the epidemic and are, as yet, unclear about the strategies they might employ in their contexts to diminish serious negative health and economic impacts of the pandemic including increased morbidity and mortality and loss of livelihoods.

Learnings from the Experience of Asian Countries

A comprehensive review and analysis of the experiences (successful and unsuccessful) of countries in Asia was undertaken. This review provided the following learnings:

1. Competent leadership is essential for an agile and effective response to the pandemic.
2. The presence of a robust public health system that provides quality services is an essential prerequisite for effectively implementing policies and programs to combat the epidemic.
3. The presence of strong national institutions that have the authority and autonomy to respond to emergencies and, more specifically, to infectious disease prevention and control is important to enhance preparedness for implementing early and sustained interventions for combatting the pandemic.
4. An early and sustained response to the crisis is effective in halting the spread of the infection.
5. Partnerships of the government with the private sector and with other relevant institutions expand medical capacities to respond to national emergencies.
6. Overhauling regulatory systems to enable fast-track approvals to undertake safety measures provides an agile and effective response for managing a national crisis.
7. Engagement of the public through effective ongoing communications by the government that keep people informed of developments is critical for the success of the program.

8. Addressing equity and the social dimensions by ensuring the inclusion of marginalized and vulnerable populations is important for program success.
9. Policies are more likely to succeed and have an enduring impact when they are compatible with the culture of the country as they are then more likely to elicit public cooperation and voluntary compliance over the long term.
10. The provision of accurate, honest, complete, and unambiguous messages to the public debunking misinformation is critical for ensuring that the people are fully informed about the program as well as about their responsibilities to comply.

The experiences of different countries in Asia that are combatting the COVID-19 pandemic have provided the above-mentioned learnings. It is, however, important to underscore that to be effective and have a sustainable response there is a need to combine some or all of these learnings within a judicious mix. To illustrate this point, it may be noted that while competent leadership is necessary to confront an unprecedented crisis, it is not by itself sufficient. The country must also have an adequate infrastructure in place when the crisis strikes. Policies are more likely to succeed when an infrastructure exists to support their effective implementation. In order to be effective, policies and programs must address equity issues by reaching marginalized and vulnerable communities. In addition, these policies must be compatible with the existing culture. It is important to understand how government leadership, policies and programs, and cultural predispositions relate to each other.

Several Asian countries that have performed well have had prior experiences with epidemics in the past, including severe acute respiratory syndrome (SARS) and Middle Eastern respiratory syndrome (MERS). Based on these experiences, governments overhauled their health systems and put in place a relevant institutional infrastructure which prepared them for the COVID-19 onslaught.

Preparedness of Countries: Infrastructure for Infection Control and Health Service System

South Korea, Taiwan, Vietnam, and Singapore had established initial warning systems and had put in place an institutional infrastructure before they were attacked by COVID-19. Taiwan, Vietnam, and Singapore were hardest hit by SARS in 2003. Vietnam also experienced the Avian Influenza in 2004–2010. South Korea was less affected by SARS but was second to Saudi Arabia in terms of total MERS cases in 2015 [1]. After their experiences with SARS and MERS, these countries overhauled their health systems and so were better prepared when they were hit by COVID-19.

Infrastructure for Infection Control

More importantly, all these countries set up emergency institutions equivalent to the Centers for Disease Control (CDC). These centers were equipped with adequate staff, budgets, specialties, and autonomy to issue emergency guidelines to the public and policy advice to the government. The CDC in South Korea was upgraded to a deputy ministerial-level agency and expanded its professional specialties and autonomy. The Chair of the Central Epidemic Command within the CDC in Taiwan has the rank of a government minister [2].

Public–private partnerships were forged to enhance health capacity [2]. In addition, approval processes for developing test kits and undertaking clinical trials were defined.

Health Service System

Learnings from the SARS and MERS epidemics enabled Singapore, Taiwan, Vietnam, and South Korea to identify and fill infrastructure gaps [3, 4]. The program in Vietnam presents a successful low-cost model unlike Taiwan, South Korea, and Singapore that undertook mass testing, Vietnam implemented a proactive prevention strategy which was feasible given its limited resources.

During the 2000 and 2016, Vietnam's preventive health expenditure increased by 9% per year [5]. Having learnt from the SARS epidemic, the government strengthened its public health program by including a national public health surveillance system. It built on its already data robust system and established a nearly real-time, Web-based system in 2009. A system of reporting notifiable diseases, that is now in place, enables the Ministry of Health to track epidemiological developments in the country in real time [6]. This system empowers community members to report health problems and enables the government to detect emerging outbreaks of infectious diseases [7].

Leadership: Rapid Response, Evidence-Based Strategies, and Partnerships

The role of leadership in the pandemic response remains undeniable [8]. Strong examples of countries in Asia where swift and decisive action helped allay the impact of the virus and unite nations include South Korea, Taiwan, and Timor-Leste. These examples of effective leadership witnessed a swift and agile response, strong coordination, an evidence-based approach that was well communicated, and partnership spirit [9].

Rapid Response

A well-recognized characteristic of decisive leadership is rapid response, based on a clear understanding of the threat presented by COVID-19, and that delayed action could lead to worse outcomes [8]. In a study of national responses, there was significant variation in the rate and speed at which strict measures were employed [10]. Earlier implementation was associated with better outcomes [11]. In Taiwan, leadership has been praised for its decisive action. Some have attributed Taiwan's success to its female leadership [12]. Effective leaders ensure strong and rapid coordination, given the socioeconomic and health dimensions of the pandemic. Learning from previous disease outbreaks, Singapore established a multi-ministry task force to centrally coordinate a whole-of-government response which means the movement from isolated silos in public health administration to formal and informal networks that call for collaborative responses, increase demand on the part of citizens; and for more personalized and accessible public services to transform the way the government works for the people [13].

Evidence-Based Approaches

It is very important to make decisions based on scientific evidence. Leaders who deferred to scientists and medical experts for making decisions were successful. Those who based their decisions on short-term economic or political gain lost valuable time in a situation where there was exponential growth of the pandemic. They were, therefore, not able to contain the pandemic. As the pandemic is continually evolving and knowledge about COVID-19 is increasing, it is important to based decisions on the latest available scientific information.

Partnerships

It is important to ensure that there is effective coordination between the central and provincial governments. This is critical in determining successful outcomes. Public trust and subsequent compliance were possible in the case of countries that implemented holistic programs which succeeded in mitigating economic slowdown through broad-based stimulus packages.

Leaders who adhered to the measure prescribed by the International Health Regulations (2005) were more successful [8, 14]. South Korea showed that it is essential to share data in a transparent way. It provided WHO with information on its very first case [15]. It is important for countries to collaborate and form partnerships in order to develop treatment regimens and undertake vaccination trials. WHO is supporting global partnerships through its Solidarity Fund, COVID-19 Supply Chain System,

and Solidarity Trial [16, 17]. A pandemic that presents a global threat requires all leaders to step up, collaborate, and cooperate in decisive action [8].

Equity and Social and Cultural Dimensions

The experience of Asian countries with COVID-19 illustrates the importance of incorporating equity and related societal considerations within policies and programs. Preventive strategies should be implemented to reach everyone regardless of citizenship, age, gender, and class.

Equity and Society

A policy focus on mainstream societal groups could mask simmering problems among marginalized groups and ultimately ruin early progress in the fight against COVID-19. In Singapore, for example, major outbreaks emerged among migrant workers after the country's initial success in containing the spread of the virus. It was estimated that migrant workers living in government-run dormitories accounted for 88 percent of the increased cases [18]. This experience resonates with the argument that social equity should be a major pillar of public administration not only for normative values but also for practical ones [19, 20].

An early response with solidarity of citizens and care for the vulnerable social groups was a key factor in Vietnam's successful response to COVID-19. The ethics of care in the response of Vietnam to the COVID-19 pandemic included care of the vulnerable, social groups [21].

Cultural Dimension

Citizen's compliance with the government's policy measures is essential even when some measures impose heavy demands on them. For example, in Singapore and Taiwan, there was heavy police enforcement of quarantine rules and heavy penalties if these were not adhered to. Public cooperation and voluntary compliance are needed for the government's policies to succeed.

In the Asian collective culture, individuals are willing to sacrifice their freedom during a crisis for the collective good [22]. Communities in Asia have a long history of threats from wars, natural disasters, and diseases, which have shaped strong social norms and strict principles governing social behavior [23]. In South Korea strong actions were undertaken such as using government apps for quarantine and mandating rule-breakers to wear wristbands, that are supported by its collectivist culture.

Communications

It is evident that a successful COVID-19 response demands the need for trusted public communication. Although government action is necessary to implement wide-scale measures, individual behavior is important in limiting the spread of COVID-19, with emphasis on the importance of ensuring individual rights [8, 24, 25]. In Vietnam and South Korea, for example, the governments harnessed the potential of information technology to set up Web sites and apps for epidemiological information and surveillance. Building trust requires clear and consistent communication based on reliable and credible sources, thus promoting transparency and accountability. Political partisanship adversely affects health behaviors and policy preferences, thus determining success or failure of the COVID-19 response [8, 26]. Factors that undermine trust such as political polarization should be overtly and deliberately addressed by leaders. Effective communication needs to emphasize a shared identity against the COVID-19 threat.

Governments that used COVID-19 to accumulate power, target the media, and silence critics fared poorly. Using emergency powers in such ways only serves to propagate mistrust. If authoritarian leaders look at a pandemic as a political opportunity instead of a public health crisis, their priorities are terribly misplaced, and lives are lost as a result. Governments that communicated with their publics in a transparent manner tended to quickly win the confidence of their people.

Furthermore, governments that acknowledged the problem, communicated the risks, outlined effective mitigation efforts, and spoke with one voice fared much better than governments that had multiple speakers or leaders who down-played the threat, publicly reversed their stand, denied the science, identified scapegoats, and fueled conspiracy theories. Greater trust led to much greater support, social engagement, and compliance when it came to wearing face masks and social distancing. Singapore and Vietnam are models of effective communication and transparency. While Vietnam is a fully authoritarian state, and Singapore is quasi-authoritarian, regime types that are not always cited as transparent but both know that in public health matters transparency and communication are key. Vietnam, in particular, deserves credit for its transparent communication strategy, TikTok dances, and a catchy hand-washing campaign. This has been a course reversal since SARS hit in 2003. Today, the Vietnamese government has become a model of transparency and effective communication [27].

Box 1: Vietnam's patriotic communication campaign

One of the ways in which the Vietnamese pandemic response differed from other countries is that the government relied heavily on the power of communication to engage its people—from all walks of life—to join the government-led fight against COVID-19. 'Early, decisive, and transparent actions by the country's leadership, along with the engagement and solidarity of citizens,

have been a key to Vietnam's success in combating COVID-19 to date' [28]. This strategy aimed at increasing solidarity and care for oneself and one's fellow citizens. The Government of Vietnam employed the war rhetoric from the beginning of its pandemic response emphasizing solidarity in winning the war over the virus. 'In Vietnam, news coverage was marked by a prominent narrative: Every citizen is a soldier fighting the disease' [29]. The Prime Minister of Vietnam, Nguyen Xuan Phuc, represented the pandemic as a battle and called on the citizens to unite in the fight [28]. The communication strategy portrayed the COVID-19 pandemic as the enemy in Vietnam. Social distancing and hand-washing were identified as a matter of patriotism, and this message resounded through all information campaigns and popular art [28]. For example, a famously cited viral poster communicated the message 'to stay home is to love your country' [29]. The Prime Minister's unified message 'Every business, every citizen, every residential area must be a fortress to prevent the epidemic' echoed throughout the pandemic's communication campaign [21, 30].

At the start of the outbreak, the communication to Vietnamese citizens was centrally led. It focused on communicating about the spread of the virus and its potential impact on local lives and livelihoods. At this stage, communication was necessarily centralized, implying that information was vertically communicated starting from the central government down to citizens. This approach leveraged national television, which played the primary role. However, as the pandemic continued and its risks increased, the communication strategy also changed. Soon communication reached the most remote communities as a result of the country's nationwide, public loudspeaker system, and network of mass organizations. While vertical communication through national television remained, horizontal and informal channels were subsequently adopted. For example, a door-to-door method was employed, with leaflets being provided. Of these latter methods, what has been most interesting is the application of the public loudspeaker system that is available in all cities, provinces, and rural areas across the country. The loudspeaker was accompanied by innovative mobile communications, for example, communication mini-trucks and motorbikes, which travel to the country's remote areas.

Vietnam's strong network of mass organizations, including the Women's Union, Farmers' Association, and the Youth Union across the country have been central to two-way communication regarding the pandemic. These networks reach every neighborhood and suburb. Most people in communities are members of one or another mass organization that proactively communicates the decisions of the government nationwide. In response to the rapid spread of COVID-19, these organizations were a key task force in supporting information spread and securing active citizen engagement during the pandemic response.

Country Policies and Strategies

The strategies employed by Taiwan, South Korea, Vietnam, and Singapore are discussed in the next section.

Taiwan

Decisive, Rapid Response

Taiwan responded rapidly and efficiently and was successful in combating the pandemic even though it is located geographically close to China and does not have WHO membership. With 446 cases and seven deaths as of the June 22, 2020, in a population of 23.8 million, Taiwan has remained relatively unscathed despite its proximity to the epicenter [31]. The government responded speedily and decisively. Taiwan began to screen arrivals from Wuhan immediately after the first report from China on December 31, 2019. The Central Epidemic Command Center, which had operated well in combatting the outbreak of SARS in 2003, became functional in January 2020.

Health Insurance, Emergency Funding, and Capacity Strengthening

The lack of health insurance for large parts of the population is a major barrier in mounting an effective outbreak response [32]. In Taiwan, more than 99% of the population was covered by health insurance. Emergency funding was also approved to support COVID-19 prevention efforts and affected industries [33].

Taiwan invested in additional capacity at the CDC, hospitals, and infectious disease laboratories after the SARS pandemic. Once China released the genetic sequence of COVID-19, Taiwan developed a test kit and expanded diagnostic capacity by engaging 37 laboratories that could perform 3900 tests per day [34]. A critical component was integrating the National Health Insurance database with its immigration database, which enabled the healthcare providers to access patients' travel histories and generates real-time alerts to facilitate early detection of cases. Innovative technology forecasted detection including quick response (QR) code scanning and online reporting of travel history, contact history, and symptoms was used. High risk was subject to 14-day home quarantine with phone monitoring of compliance and health status [35].

Robust Health System

After the SARS epidemic, Taiwan's government built a robust health system that was well-equipped and well-prepared to handle the COVID-19 epidemic. The SARS experience also prepared the people for the pandemic as they engaged in social distancing and mask-wearing [33]. Thus, the public was a close partner of the government in the fight against COVID-19.

South Korea

Hospital-Based Care

Compared to other high-income countries, the number of hospital beds per capita in South Korea is much higher at 12.3 beds per 1000 population. This is over two times the average of Organization of Economic Cooperation and Development (OECD) [36]. Although some critics suggest that South Korea's health system is over-indexed on hospitals—often sources of secondary or tertiary care—to the detriment of primary care, this increased capacity-enabled hospitals to respond quickly to COVID-19 without sacrificing care for non-COVID-19 patients [37]. Despite its robust health system, South Korea struggled to respond to the 2015 outbreak of MERS, with nearly 17,000 suspected cases and 38 deaths. During the six months of that outbreak, Koreans lived in fear, and the government lost an estimated USD 2.6 billion in tourism revenue while spending almost USD 1 billion on diagnosis, treatment, and other response activities.

Pandemic Preparedness

After MERS, the country made a series of policy changes to improve pandemic preparedness and response. When COVID-19 struck, the painful memory of MERS inspired an early government response as well as a willingness among people to wear masks, cooperate with contact tracers, and listen to public health officials. A recent poll showed that more people adhered to public prevention protocols during the COVID-19 outbreak than during the MERS outbreak [37]. After the peak of 900 cases on February 29, 2020, the number of cases fell rapidly in the following two weeks until it hovered below 200 daily confirmed cases by March 12, 2020. Daily cases steadily declined to nearly zero, although there was a minor resurgence in mid-May (about 30 cases per day), as the country started to reopen.

Improving Epidemic Intelligence Service

The government transformed public facilities owned by private corporations into temporary isolation wards. This prevented transmission within households and also relieved hospitals of bed shortages. Healthcare workers regularly monitored and quarantined clinically stable patients who did not warrant in-patient treatment [38]. South Korea expanded its usual workforce of Epidemic Intelligence Service (EIS) officers quickly by training staff at local public health centers, hiring 300 private epidemiologists and leveraging staff at 11 non-governmental organizations that train and support EIS officers. These efforts led to earlier case detection, kept the rate of new infections low, and potentially reduced fatality rates by preventing hospital overcrowding [37].

During a shortage of hospital beds in the epicenter of Daegu, health officials developed a triage system using a severity scoring system to classify patient illnesses as mild, moderate, severe, and critical. Mildly ill patients were sent to community treatment centers where they were closely monitored. Moderately ill patients were sent to community hospitals, and severe or critically ill patients were hospitalized at tertiary hospitals equipped to provide intensive care [38]. Also, 2400 additional healthcare workers were spread out among these institutions.

The population in South Korea is highly urbanized with over 80% living in urban areas [39]. Culturally and legally South Korea is more tolerant of personal data sharing, and its success has been heavily dependent on its ability to rapidly scale up technological solutions. Countries with less technology and where citizens do not have smart phones or are not willing to share their data may experience difficulties adopting such strategies. Despite these differences, many of South Korea's strategies, including its investments in preparedness, decisive, and data-drive leadership, strategic clarity, and willingness to be innovative can be adapted in other countries. South Korea showed that it is possible to contain the coronavirus without shutting down the economy [40, 41].

South Korea's Fast Intervention

The government began to act within a week of the diagnosis of its first case. Approvals for developing test kits were followed by thousands of test kits shipped daily. South Korea now produces 100,000 kits per day and plans to export them. Furthermore, South Koreans were primed to treat the coronavirus as a national emergency, after a 2015 outbreak of MERS in the country, which killed 38 persons.

Test Early, Often, and Safely

Initially, the South Korean government was accused of complacency. Its testing campaign, however, was successful in sparing hospitals from being overwhelmed. Testing centers were set up to screen as many people as possible in the shortest

possible time. Drive-through stations tested people in their cars. This procedure was completed in 10 minutes. And test results were available within hours.

About a week after the first COVID-19 case, the Korean CDC directed private companies to produce a diagnostic reagent [42]. Within two weeks of the first case, thousands of test kits were shipped daily with the numbers reaching up to 100,000 kits in March [41]. By April 24, 2020, 118 institutions were available to run diagnostic tests. Collectively, these institutions have the capacity to run an average of 15,000 tests (up to 20,000) per day. COVID-19 screening clinics were set up. Those flagged by the screening were tested and told to return home and self-quarantine. By late March, the country had performed over 300,000 tests, which were more than 40 times per capita than in the United States at that time.

Full and Transparent Messaging

Relentless public messaging urged South Koreans to seek testing if they or someone they know developed symptoms. Visitors from abroad were required to download a smartphone app that guided them through self-checks for symptoms. Offices, hotels, and other large buildings often used thermal image cameras to identify people with fever. Many restaurants checked customers' temperatures before accepting them. This allowed health workers to identify networks of possible transmission early, carving the virus out of society.

South Korea developed tools and practices for aggressive contact tracing during the MERS outbreak. Health officials retraced patients' movements using security camera footage, credit card records, and even GPS data from their cars and cellphones. 'We did our epidemiological investigations like police detectives', according to Dr. Ki, epidemiologist advising the government's coronavirus response. 'Later, we had the laws revised to prioritize social security over individual privacy at times of infectious disease crises'. [41, 43].

People's cellphones received emergency alerts when a new case was discovered in the district. The movements of the people were tracked through smart phone apps and Web sites. These movements were tracked hourly or even minute-to-minute. Loss of privacy has been a trade-off in implementing this system.

Community Engagement

Leaderships kept the public informed and saught its active cooperation. Reminders were continuously sent to smart phones, and mass media was also used. These messages asked people to wear face masks and maintain social distancing. The public responded well. Polls showed high confidence and low panic. The messaging generated a war-time sense of purpose. Officials also credit the country's nationalized healthcare system, which guarantees care and special rules covering coronavirus-related costs, giving even people with no symptoms greater incentives to get tested.

Vietnam

Effective Testing and Contact Tracing

Vietnam's first case of COVID-19 was reported on January 23, 2020. A week after the first case was confirmed, Vietnam formed a national steering committee to coordinate the program. A second wave of cases was discovered on March 6, 2020. These cases were imported from new hot spots including Europe, Great Britain, and the United States. On May 1, 2020, a hundred days into the outbreak, Vietnam had confirmed just 272 cases despite extensive testing.

Starting in early February 2020, publicly funded institutions in Vietnam developed at least four locally made COVID-19 tests validated by the Ministry of Defense and the National Institute of Hygiene and Epidemiology. Subsequently, private companies also manufactured test kits. Testing capacity was also ramped up quickly, from just two testing sites nationwide in late January to 120 by May 2020. When community transmission was detected (even just one case), the government reacted quickly with contact tracing, community-level lockdowns, and widespread local testing to ensure that no case was missed. This helps explain why Vietnam has performed more tests per confirmed cases than any other country in the world—by a longshot—even though testing per capita remains relatively low.

Vietnam's contact tracing strategy stands out as uniquely comprehensive. It is based on testing degrees of contact from F0 (the infected person) though F1 (those who have had close contact with F0 or are suspected to be infected), F2 (close contact with F1), and all the way up to F5. A noteworthy aspect of Vietnam's approach is that identified and quarantined suspected cases are based on their epidemiological risk of infection (if they had been in contact with a confirmed case or traveled to a COVID-19 infected country), not whether they exhibited symptoms. The high proportion of cases that never developed symptoms (43%) suggests that this approach may have been a key contributor to limiting community transmission at an early stage [44].

On March 10, 2020, the Ministry of Health worked with telecom companies to launch NCOVI, an app that helps citizens put in place a 'neighborhood watch system' that complements official contact tracing efforts and may have helped to slow transmission of the disease. NCOVI includes a map of detected cases and clusters of infections and allows users to declare their own health status, report suspected cases, and watch real-time movements of people placed under quarantine [45]. In mid-April 2020, a Bluetooth-enabled mobile app was developed. It notifies users if they have been within approximately six feet of a confirmed case within 14 days. When users are notified of exposure, they are encouraged to contact public health officials immediately [46].

Improved Hospital Infection Control

During the SARS epidemic in 2003–2004, a number of Vietnamese healthcare workers were infected. Apart from the index patient, everyone in Vietnam who died from SARS was a doctor or a nurse [47]. Over the past ten years, Vietnam significantly improved hospital infection control. In preparation for the COVID-19 pandemic, Vietnam further strengthen hospital procedures to prevent infections in healthcare settings.

Although most COVID-19 patients in Vietnam were hospitalized at specialty hospitals in Hanoi and Ho Chi Minh City, healthcare facilities at all levels were prepared to receive them to avoid overwhelming the acute care system. Although Vietnam has not enough cases to overload hospitals, it is worth noting that only four healthcare workers were infected up to June end.

Transparent and Proactive Communications

The Vietnamese government positioned itself as an effective leader during the pandemic by providing information with transparency. The Ministry of Health took the initiative to launch a Web site and a mobile application not only to ease the medical process but also to disseminate accurate information quickly. The digital apparatus helped stem the spread of rumors and fake news, in addition to legal enforcement against people who spread inaccurate information or engage in profiteering. State media constantly covered the hot spots of the pandemic to raise public awareness about the seriousness of COVID-19 and to demonstrate that robust government intervention is essential. By being transparent and proactive in communicating with the public, the government was able to gain and maintain public confidence [27, 48].

The Prime Minister declared war on the virus. He mobilized the nation by imploring to their civic duties. As a result, this relatively poor, one-party state was able to contain the pandemic. It should also be noted that Vietnam was the first country to contain the SARS outbreak—in just 20 days.

Large-scale monitoring and testing and regular temperature scans at airports and other public places resulted in very few cases (about 267) and no deaths as of April 15, 2020. Vietnam also set up infection chambers at clinics to eliminate the transmission of infection. Vietnam is exporting masks to USA and Europe [49, 50].

Singapore

Prompt and Comprehensive Approach

Singapore is a city-state within South-East Asia with a multiethnic population. With high levels of travel and connectivity to the world, it was a key location of the SARS outbreak in 2003. Experience with SARS significantly influenced the country

response to COVID-19. Singapore was one of the first countries outside China to identify, document, and diagnose SARS-CoV-2 infections including local transmission [51, 52]. The first case was confirmed on January 23, 2020, and by February 4, 2020, local transmission was reported.

Singapore was ready when WHO declared COVID-19 as a public health emergency at the end of January. Singapore implemented an early and whole-of-government approach to direct public health measures. It restricted in-bound air travel to reduce imported cases. There was extensive testing and meticulous contract tracing and ensuring proper quarantine and/or isolation in Singapore. Clear and consistent public messaging regarding policy was timely, evidence-based, and trusted. And, a clear mandate to promote innovation and research was implemented. There was preparedness for the pandemic because of Singapore's experience with the SARS epidemic. The National Center for Infectious Diseases (NCID) and a National Public Health Laboratory were set up to specifically tackle emerging infectious diseases and potential pandemics.

Every national hospital quickly and seamlessly transited to a state of operational readiness. The 3-P approach (planning, preparedness, and protective equipment) was successful in flattening the curve and ensuring that healthcare facilities did not become overwhelmed despite the higher-than-usual caseloads, while strictly adhering to the fundamentals of high quality and accessible medical care.

Research and Education

In its response to COVID-19, Singapore prioritized clinical, translational, and basic science from the early stages of the pandemic. National funding schemes such as COVID-19 Research Fund were launched through the National Medical Research Council.

Finally, education and training strategies for medical students and practicing residents were restructured quickly to include required assessments and examinations in line with Singapore's digital SMART nation evolution. Contract tracing, temperature monitoring, and even the robotic delivery of meals to patients isolated in community build facilities were undertaken. While COVID-19 presented a complex and wide range of clinical, research, and logistical challenges to which Singapore responded promptly. The country is now undergoing a carefully calibrated and phased return to a new 'post-COVID' normal [53].

> **Box 2: Timor-Leste's success despite a fragile healthcare system and limited resources**
> Timor-Leste, an island nation of 1.3 million people, responded swiftly and effectively in dealing with the COVID-19 pandemic, despite a fragile healthcare system and limited resources. As soon as WHO warned the world of the threat of COVID-19 and subsequently declared a Public Health Emergency

of International concern on January 30, 2020, the Prime Minster along with parliament and senior government officials raised the alarm for urgent action. The Prime Minister set up a crisis management center and a multi-sector task force, which then developed the National COVID-19 Preparedness Action Plan with support from WHO and other partners.

Even before the first confirmed case in the country, as immediate assistance, WHO prioritized availability of essential medical supplies and testing kits to Timor-Leste. Given the importance of timely and quality testing, WHO provided the National Health Laboratory (NHL) primers and probes to carry out 1000 COVID-19 tests. Personal protective equipment (PPE), including gloves, gowns, goggles, and masks, was also made available. Support included numerous technical guidelines adapted to the Timor-Leste context, laboratory support, training of health workers, and surveillance capacity. In addition to activating the Incident Management System (IMS), WHO provided support to the Ministry of Health to conduct training sessions for health workers, point of entry staff, emergency responders, and rapid response teams. A Web-based COVID-19 surveillance portal was created, and national staff were trained in active surveillance and contact tracing.

A country with no testing capacity, no identified isolation and quarantine facility, and limited surveillance capability was transformed into one with in-country testing, functional COVID-19 facilities, staff rapidly trained in infection control and case management, a gradual increase in PPE stocks, capacity for an expanding testing strategy, and active surveillance capabilities over a relatively short period of 4–6 weeks.

Timor-Leste has been a close partner of WHO. WHO advises the government on quality standards and quarantine facilities. WHO also provides advice on health and social interventions as well as monitoring and evaluation.

The country is currently under a State of Emergency, with no new cases reported for over five months. There have been 27 confirmed cases, 25 recovered cases, and no deaths, so far. Almost all cases are linked to well-defined clusters in government quarantine facilities. The expanded testing strategy in health facilities has not identified any signs of community transmission as yet [54].

Box 3: Mongolia's success story

Mongolia has achieved notable success in protecting the health of its people by preventing the community spread of COVID-19. As of mid-August 2020, Mongolia had experienced no deaths from COVID-19 and had 300 cases, all of which were imported. The COVID-19 outbreak was declared a pandemic by WHO on March 11, 2020. In recognition of the severity of the outbreak, the

Government of Mongolia activated the State Emergency Committee (SEC) in January 2020, on the basis of the 2017 Disaster Protection Law. As a result, various public health measures were undertaken, which led to delaying the first confirmed case of COVID-19 until March 10, 2020. These measures include promoting universal personal protection and prevention such as the use of face masks and hand-washing, restricting international travel, suspending all training and educational activities from kindergarten to universities, and banning major public gathering such as the celebration of the national New Year holiday. These measures were accompanied by active infection surveillance and self-isolation recommendations [55].

For a low–middle-income country, Mongolia has a remarkably high literacy rate. Female literacy rate is 96.4%, and male literacy rate is 93%. A high literacy rate has notable implications for public education and understanding of public health initiatives. In Mongolia, 2.5 million people use mobile telephones of which 70% are smartphones, thus providing a valuable opportunity for the dissemination of public messages [56].

Mongolia is currently undergoing a health system reform nationally with primary care and secondary care centers well established. There are approximately 12,000 doctors nationwide, translating into one physician for 283 people, and more than 20,000 mid-level health workers of which more than 12,000 are nurses. Although the general infrastructure and facilities are inadequate and not well-equipped, Mongolia's ICU capacity is remarkably high. There are 349 intensive care beds and 443 critical care ventilators in 70 ICUs countrywide, which translates to approximately 11 ICU beds per 100,000 population. In late January 2020, based on the SEC risk assessments, initial travel bans were introduced by the government to prevent the importation of COVID-19 [57].

From early on, the public were engaged and kept up-to-date through public information provision and action, coordinated by the SEC and organized by government agencies. Predominantly spreading health promotion messages via public media, the SEC initiated a one-window policy to provide accessible and reliable information from only one source. Although no general lockdown was imposed on all Mongolian citizens, some businesses in which physical distancing was not possible, such as the entertainment industry, including nightclubs and bars were closed [57].

Before the end of February, a structured surveillance system for contact tracing was put in place to enable the required observation and isolation of contracts to contain the spread of the disease. Suspected cases and their contacts were identified with the use of case-definition-derived criteria. COVID-19 healthcare and quarantine services were free of charge, except for three meals at a cost of USD 20 per day, during mandatory quarantine [58].

The Mongolian case shows that with advanced preparedness and robust preventive systems, an effective response to a pandemic is indeed possible for a low–middle-income country.

Concluding Comments

The success of Taiwan, South Korea, Vietnam, and Singapore in combating COVID-19 demonstrates the importance of strong leadership in mitigating the pandemic by harnessing the power of rapid response, evidence-based approaches, transparent communication, and partnerships in building a sustainable and successful pandemic response. Founded on principles of participation, transparency, and accountability, lessons from these examples in Asia are spread open for the world to learn from and emulate. These experiences shift the process of generating and enforcing top-down policies to multi-stakeholder, participatory approaches by leveraging swift action and opportunities. Strong and compassionate leadership is undoubtedly the defining trait of nations to navigate time-sensitive issues in today's pandemic era. Leaders must act decisively to the COVID-19 response with a whole-of-government approach. The presence of robust public health systems along with strong national institutions that can respond swiftly to prevent the spread of infection is an essential prerequisite for containing the epidemic. Policies that address equity issues and are compatible with the cultural context have an enduring impact. Engagement of the public through effective communications is critical for public cooperation and voluntary compliance over the long-term. In countries where large numbers of infections are still being reported, it is time that leaders acknowledge the importance of acting rapidly on the best available evidence with transparency, a responsibility that is particularly critical in low-income and fragile settings.

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