


**BUILDING AND SUSTAINING CAPACITIES OF HEALTH OFFICIALS IN USE OF DATA FOR DECISION-MAKING: EVIDENCE FROM RAJASTHAN, INDIA**

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ARTICLE INFO	ABSTRACT
<p><b>Article history:</b></p> <p><b>Received</b> 31 July 2023</p> <p><b>Accepted</b> 30 October 2023</p>	<p><b>Purpose:</b> This paper critically explores the initiatives that were implemented in Rajasthan during the period of 2018-19 by UNFPA, in collaboration with the Department of Health and Family Welfare, the Government of Rajasthan, and IIHMR University, Jaipur, Rajasthan, India. The main objective of these initiatives was to strengthen the capabilities of health officials and data managers at different levels within the state, enabling them to make evidence-based decisions using data effectively.</p>
<p><b>Keywords:</b></p> <p>Data for Decision Making; Sustainable Development Goals; Health Management Information System; Mentoring and Handholding; Google Classroom; Information and Communication Technology (ICT).</p>	<p><b>Theoretical framework:</b> The capacity-building program was designed to reinforce the system for evidence-based planning, monitoring, and data utilization through a comprehensive training approach and continuous support. This study thoroughly investigates the entire process, assesses its effectiveness, and draws policy recommendations based on the outcomes of the capacity-building interventions. An essential aspect underscored by the study is the importance of providing ongoing support and guidance post-training to ensure sustainable development and successful implementation of the acquired knowledge.</p>
	<p><b>Methodology:</b> The methodology described in this paragraph involves capacity building approaches for government officials in the health sector. Specifically, the methodology includes the following elements: capacity building approaches; Inhouse Training programme technique; Digital technology enabled process; Training of State, District, and Block Level Health Programme Officials and Data Managers; Mentoring and Hand-Holding Support; Web-Based Learning Method using 'Google Classroom.</p> <p><b>Findings:</b> The findings of this study emphasize two crucial factors that contributed to the success of the capacity-building initiatives. Firstly, the provision of on-site assistance proved to be highly effective in reinforcing the newly acquired knowledge and skills. Secondly, the utilization of the web-based Google Class platform was found to be instrumental in promoting knowledge retention and enhancing the effective utilization of data.</p> <p><b>Value:</b> In conclusion, this research sheds light on the significance of capacity-building initiatives in the realm of health and data management. It highlights the positive impact of on-site support and the role of technology, particularly the Google Class platform, in ensuring the lasting benefits of such programs. The paper concludes by underlining the importance of continued support and sustained efforts in maximizing the potential of data-driven decision-making in the healthcare sector in Rajasthan.</p> <p>Doi: <a href="https://doi.org/10.26668/businessreview/2023.v8i11.4003">https://doi.org/10.26668/businessreview/2023.v8i11.4003</a></p>

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## CONSTRUINDO E SUSTENTANDO CAPACIDADES DOS FUNCIONÁRIOS DE SAÚDE NO USO DE DADOS PARA TOMADA DE DECISÕES: EVIDÊNCIAS DE RAJASTHAN, ÍNDIA

### RESUMO

**Objetivo:** Este artigo explora criticamente as iniciativas que foram implementadas no Rajastão durante o período de 2018-19 pelo UNFPA, em colaboração com o Departamento de Saúde e Bem-Estar Familiar, o Governo do Rajastão e a Universidade IIHMR, Jaipur, Rajastão, Índia. O principal objectivo destas iniciativas era reforçar as capacidades dos funcionários de saúde e gestores de dados a diferentes níveis do estado, permitindo-lhes tomar decisões baseadas em evidências, utilizando dados de forma eficaz.

**Quadro teórico:** O programa de capacitação foi concebido para reforçar o sistema de planeamento, monitorização e utilização de dados baseados em evidências através de uma abordagem de formação abrangente e apoio contínuo. Este estudo investiga minuciosamente todo o processo, avalia a sua eficácia e formula recomendações políticas com base nos resultados das intervenções de capacitação. Um aspecto essencial sublinhado pelo estudo é a importância de fornecer apoio e orientação contínuos após a formação para garantir o desenvolvimento sustentável e a implementação bem sucedida do conhecimento adquirido.

**Metodologia:** A metodologia descrita neste parágrafo envolve abordagens de capacitação para funcionários governamentais no sector da saúde. Especificamente, a metodologia inclui os seguintes elementos: abordagens de capacitação; Técnica do programa de treinamento interno; Processo habilitado para tecnologia digital; Treinamento de Funcionários de Programas de Saúde de Nível Estadual, Distrital e de Bloco e Gerentes de Dados;

**Mentoria e suporte manual:** Método de aprendizagem baseado na Web usando o 'Google Classroom.

**Constatações:** As conclusões deste estudo enfatizam dois factores cruciais que contribuíram para o sucesso das iniciativas de capacitação. Em primeiro lugar, a prestação de assistência no local revelou-se altamente eficaz no reforço dos conhecimentos e competências recentemente adquiridos. Em segundo lugar, a utilização da plataforma Google Class baseada na Web foi considerada fundamental para promover a retenção de conhecimento e melhorar a utilização eficaz dos dados.

**Valor:** Em conclusão, esta investigação esclarece a importância das iniciativas de capacitação no domínio da saúde e da gestão de dados. Destaca o impacto positivo do apoio no local e o papel da tecnologia, especialmente a plataforma Google Class, na garantia dos benefícios duradouros de tais programas. O documento conclui sublinhando a importância do apoio contínuo e dos esforços sustentados para maximizar o potencial da tomada de decisões baseada em dados no sector da saúde no Rajastão.

**Palavras-chave:** Dados para Tomada de Decisão, Metas de Desenvolvimento Sustentável, Sistema de Informação de Gestão em Saúde, Mentoria e Handholding, Sala de Aula Google, Tecnologia da Informação e Comunicação (TIC), Saúde Digital.

## CREACIÓN Y MANTENIMIENTO DE CAPACIDADES DE FUNCIONARIOS DE SALUD EN EL USO DE DATOS PARA LA TOMA DE DECISIONES: EVIDENCIA DE RAJASTHAN, INDIA

### RESUMEN

**Propósito:** Este documento explora críticamente las iniciativas que el UNFPA implementó en Rajasthan durante el período 2018-19, en colaboración con el Departamento de Salud y Bienestar Familiar, el Gobierno de Rajasthan y la Universidad IIHMR, Jaipur, Rajasthan, India.

El principal objetivo de estas iniciativas fue fortalecer las capacidades de los funcionarios de salud y administradores de datos en diferentes niveles dentro del estado, permitiéndoles tomar decisiones basadas en evidencia utilizando datos de manera efectiva.

**Marco teórico:** El programa de desarrollo de capacidades fue diseñado para reforzar el sistema de planificación, monitoreo y utilización de datos basados en evidencia a través de un enfoque de capacitación integral y apoyo continuo. Este estudio investiga a fondo todo el proceso, evalúa su efectividad y elabora recomendaciones de políticas basadas en los resultados de las intervenciones de desarrollo de capacidades. Un aspecto esencial subrayado por el estudio es la importancia de brindar apoyo y orientación continua después de la capacitación para garantizar el desarrollo sostenible y la implementación exitosa de los conocimientos adquiridos.

**Metodología:** La metodología descrita en este párrafo involucra enfoques de desarrollo de capacidades para funcionarios gubernamentales en el sector de la salud. Específicamente, la metodología incluye los siguientes elementos: enfoques de creación de capacidad; Técnica del programa de formación interna; Proceso habilitado por tecnología digital; Capacitación de funcionarios de programas de salud y administradores de datos a nivel estatal, distrital y de bloque; Mentoría y apoyo de la mano; Método de aprendizaje basado en web utilizando 'Google Classroom.

**Hallazgos:** Los hallazgos de este estudio enfatizan dos factores cruciales que contribuyeron al éxito de las iniciativas de desarrollo de capacidades. En primer lugar, la prestación de asistencia in situ demostró ser muy

eficaz para reforzar los conocimientos y habilidades recién adquiridos. En segundo lugar, se descubrió que la utilización de la plataforma Google Class basada en la web era fundamental para promover la retención de conocimientos y mejorar la utilización eficaz de los datos.

**Valor:** En conclusión, esta investigación arroja luz sobre la importancia de las iniciativas de desarrollo de capacidades en el ámbito de la salud y la gestión de datos. Destaca el impacto positivo del soporte in situ y el papel de la tecnología, en particular la plataforma Google Class, para garantizar los beneficios duraderos de dichos programas. El documento concluye subrayando la importancia del apoyo continuo y los esfuerzos sostenidos para maximizar el potencial de la toma de decisiones basada en datos en el sector de la salud en Rajasthan.

**Palabras clave:** Datos para la Toma de Decisiones, Metas de Desarrollo Sostenible, Sistema de Información de Gestión de Salud, Tutoría y apoyo, aula de Google, Tecnologías de la Información y la Comunicación (TIC), Salud Digital.

## INTRODUCTION

Health system's strengthening has been a priority of national health agendas to improve health outcomes and to achieve Sustainable Development Goals (SDGs). The World Health Organization (WHO)'s framework for health systems strengthening identifies six attributes or building blocks of a health system. Health information systems is not only one of the building blocks but is foundation for the overall health system in terms of informed decision making in each of the other five building blocks. The health system uses a combination of health statistics from different sources, to derive information about the health status of people, provision and utilization of health services, functioning of different components of health system, and the impact in terms of health outcomes (Kaisa et.al. 2006). The improved information, demand for data, and continued data use creates a cycle that leads to improved health programs and health outcomes. Positive experiences of using data in turn contribute to increased demand for data, continued commitment to improve data quality, and effective data use for programme management. Because programs often fall short of efficient use of data to inform decisions, there is a need to strengthen the utilization of data to support evidence-based decision-making at different levels of the health system.

In the health system, health management information system (HMIS) is designed to integrate data collection, processing, reporting and use for the information for programme planning, implementation, monitoring and evaluation. During last two decades, Healthcare systems and organizations have significantly expanded the utilization of information technology for improving their efficiency in managing highly complex and demanding tasks within the health care systems. A systematic review by Kaisa et.al (2006) concluded that although the use of management information systems in health sector is ever-increasing, the number of scientific studies concerning training of health professionals and its impact on work performance is limited. However, it was realized that the health officials are lacking the desired

capacity for appropriate analysis and use of data for monitoring program performance and taking corrective actions locally. Because of this limited capacity, data is transmitted without proper understanding or analysis to higher reporting levels. There is a need for improving the skills of supervisors at all levels for appropriate use of data received from lower levels and providing feedback so that appropriate corrective action can be initiated.

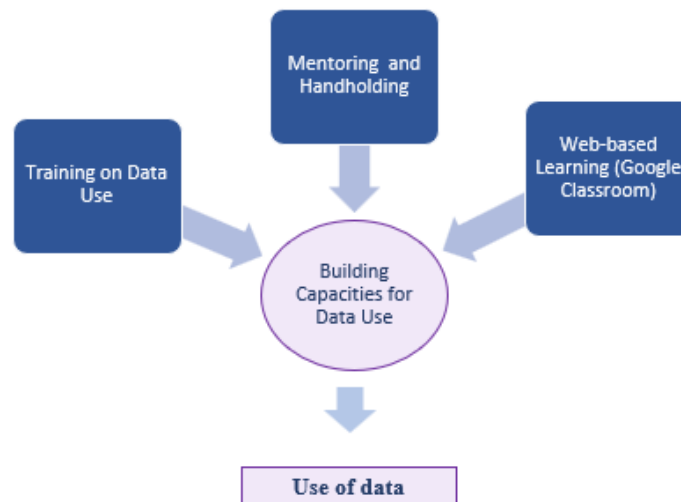
Training is one of the important processes in human resource development (HRD), which aims at augmenting the knowledge, skills, and competencies of staff for carrying out specific activities. It helps in shaping the thought process of the staff and improves quantitative as well as qualitative aspects of their work performance. Training is generally imparted either 'on the job' or 'off the job'. In 'on the job' trainings, employees are trained in their actual working scenario following the concept of 'learning by doing' (Sharma & Tripathi, 2022). On the other hand, 'off the job' trainings are provided away from their actual working situations, and makes it possible to train large number of staff in relatively as short period of time. In-service training plays a critical role in developing and maintaining essential competencies required for delivery of effective public health services. However, in spite of huge investments in trainings, there is very limited evidence about the effectiveness of the methodologies and techniques commonly applied in various settings, regardless of the level of resource (Bluestone et.al. 2013).

## **METHODS**

### **Capacity Building Initiatives**

The operational Strategy to achieve this objective included training of state, district and block level health programme officials and data managers. After the training, they were provided mentoring and hand holding support for a period of around six months. The mentoring included handholding support at their workstations as well as information through web-based learning method using 'Google Classroom'. The details of the interventions are as follows:

Figure 1: Capacity Building model for Data Use



Source: Prepared by the researchers based on the outputs of the statistical program SPSS 25

### Trainings on Data Use

A training programme was designed to enhance the knowledge and skills of the health officials at state, district and block levels on use of data for decision-making. Two groups of health officials were covered: (a) Programme Officers (POs), which included health officials looking after different programmes; and (b) Data managers (DMs), who are responsible for managing and analyzing the health data. The curriculum for the trainings was developed through a structured approach, involving following steps:

- **Situational analysis:** It was done to understand the current level and practices of data use at different levels of health institutions, and to understand the capacity building needs for use of data at different levels.
- **Consultation Workshop:** It was organized with various levels of staff to understand current practices, gaps in knowledge and skills and their expectations for training on data use.
- **Content Development:** It was done jointly by IIHMR and UNFPA based on the findings of consultation workshop and the experiences of doing such trainings in other states.
- **First training as pretest:** The first batches of each group of trainees provided the input for refining the training materials and methodology. After finalization, it was replicated for the remaining batches.

The training programmes were organized during July 2018 to December, 2019. A total of 324 health officials (including 112 Programme Officers and 212 Data Managers) were

trained in 12 batches. The trainings involved participatory approach with group-exercises and hands on practice.

Pretest and post-test were done to assess the training programmes. Feedback of participants about the quality of training (including contents, training methods, trainers, training facilities, etc.) was taken for every training programme. The feedback was used for continuous improvement of the trainings. The results of the pretest and post-test indicated a substantial change in the average scores of the training participants. The qualitative feedback post training also indicated that nearly 80 percent of the participants were highly satisfied with the training programmes (including contents, methodology, resource persons, arrangements, etc.).

### **Mentoring and Handholding**

After the training, the state, district, and block level programme officials and data managers were provided with mentoring and handholding support for a period of six months. The mentoring included helping them use the skills of data analysis and interpretation for planning and monitoring of various health programs. For this purpose, a mentoring team was created under the project, which consisted of faculties and research officers from IIHMR, UNFPA officials and identified officials from the health system. The mentoring team members visited various districts and blocks on a regular basis to provide necessary support.

The mentoring team used to have discussions with the health officials and data managers at their workplace about different issues, like use of data, problems in analyzing and using data, making comparisons across institutions, time-series analysis and data quality related issues. During the visits, the mentors provided hands on training on carrying out analysis and using data for performance review.

### **Web-based Mentoring**

Web-based mentoring was one of the important components of the capacity building initiatives, under which, an online learning platform was created on Google Classroom. A Google group was created, and all the data managers and health officials trained previously were added as members after an orientation on how to use Google Classroom. By the end of the project 152 data managers and health officials were active on the Google Classroom. Presentations, guidelines, assignments and other relevant material were placed on the platform of Google Classroom. It was introduced as an interactive platform for sharing information, discussing issues of concerns, and solving day to day problems related to data analysis, and



organizing some refresher/orientation sessions on demand from the participants. The web-based monitoring was continued for at least six months after the trainings.

## **EFFECTIVENESS OF CAPACITY BUILDING**

### **Assessment Methodology**

Evaluation of effectiveness in research studies is generally based on the strategy of setting the desired learning goal or achieving the desired competencies (Tennant et.al. 2002). There is a wide range of tools for evaluating impacts of education according to employee performance or based on feedback (Ozioma and Ekwe, 2014). However, the assessment of retention of learnings and their use in real working is not common. However, in this study an effort has been made to assess the knowledge retention after trainings and role of alternative capacity building mechanisms on such retention.

As stated earlier, every training program followed the process of pre-test and post-test assessments of the participants. It was important in estimating the change in the level of knowledge and skills of the participants after attending the training. However, after a gap of 18 months after the trainings, a follow-up assessment was done taking a sample of 162 health officials (50% of those who participated in the training programmes) to assess how far those learnings have been sustained and being used in their actual work situation. The follow-up assessment was aimed at answering the following research questions (RQs):

RQ-1: How far was the knowledge and skills acquired during the training retained 18 months after the training?

RQ-2: Does mentoring and participation in Google Classroom affect the retention of knowledge and skills?

RQ-3: What is the level of use of data for decision-making in different health programmes?

RQ-4: Does mentoring and participation in Google Classroom affect the level of data use?

The questionnaire for pre-test, post-test and follow-up consisted of 15 questions on knowledge and skills related to data analysis and use in different programmes. The scores achieved by each participant in pretest, pos-test and follow-up test were compared. The change in scores between pretest and follow-up round was taken as retention variable. Binary logistics regression was used to assess the relationship of the retention of knowledge and skills with whether the participant received mentoring support or Google Class support, or both. For this

purpose, the variable of change in scores between pretest and follow-up was recoded into dichotomous dummy variable based on median values as cutoff point. The participants who received neither mentoring nor Google Class-room support were taken as reference category.

To assess the current level of data-use, the participants in the follow-up round were asked to score the current use of data in different programmes on a five-point Likert scale. Binary logistics regression was used to assess the relationship of current use of data with mentoring, Google support or both. The variable of scores of data-use was recoded creating a dummy dichotomous variable, based on median as the cutoff. The participants who received neither mentoring nor Google Class-room support were taken as reference category.

## RESULTS

As depicted in Figure-2, the mean scores achieved by programme officials (POs) increased from around 49 percent in pre-test to 77 percent in the post test. Similarly, the scores of data managers (DMs) also increased from 47 percent to 75 percent, indicating a change of 28 percentage points. The follow-up survey indicated a slight decline of around 9 percentage points among POs and 11 percentage points among DMs as compared to the mean scores achieved in post-test. However, comparing the follow-up scores with pretest shows a sizable difference, indicating the retention of knowledge and skills after one and a half years.



Source: Prepared by the researchers based on the outputs of the statistical program SPSS 25

The results of logistics regression analysis indicated strong and significant relationship of mentoring and participation in Google Classroom with retention of learning gained during the trainings (Table 1). The participants who received mentoring support were had around four times higher probability of retention, while the probability of retention was around 2.6 times



higher among those who actively participated in Google Classroom as compared to those who did not receive any kind of such support after training. Participants who received both kinds of support had around 4.3 times higher odds of retention than the reference group.

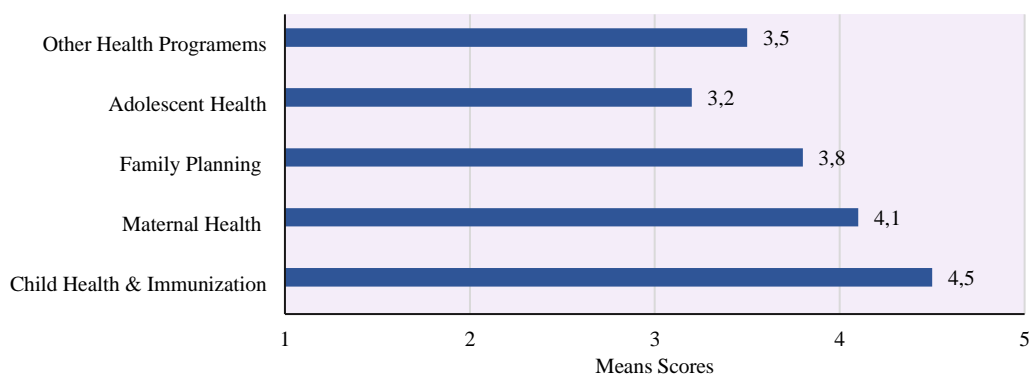
Table 1: Logistics Regression for relationship of mentoring and Google-Class support with retention of knowledge and skills.

Participant Group Received	B	P-value	Odds Ratio	95% C.I.	
				Lower	Upper
Mentoring	1.36	.000	3.91	2.12	7.23
Google-class	0.96	.002	2.62	1.44	4.77
Both supports	1.45	.000	4.26	2.14	8.47
Received None	-	-	1.0	-	-

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 25

Regarding current use of data for decision-making, the data-use scores were found to be highest regarding child health and immunization programme, followed by maternal health programme. It was reported that most of the programme officials and data managers were regularly analyzing maternal and child health indicators, like immunization coverage, dropout rates, early registration and care during ANC, institutional deliveries, etc. and using these indicators for planning and monitoring (Figure-3). Regarding family planning programme, contraceptive use was the main focus. Specifically, the data of post-partum family planning and recently introduced injectable contraceptives (Antra) was being analyzed and discussed more frequently. However, the lowest use of data was found to be in case of adolescent health programmes related indicators.

Figure 3: Scores of Data Use for Health programme



Source: Prepared by the researchers based on the outputs of the statistical program SPSS 25

The regression analysis indicated that the use of data was significantly higher among the participants who received mentioning or Google-Classroom support after the training

(Table 2). The odds of data use were 3.7 times higher among those who received monitoring support, and more than two times higher among those who actively participated on Google-Class platform. The participants who received both kinds of support had 4.3 times higher odds of data-use as compared to those who did not receive any kind of support.

Table 2: Logistics Regression for relationship of mentoring and Google-Class support with use of data for decision-making

Participant Group Received	B	P-value	Odds Ratio	95% C.I.	
				Lower	Upper
Mentoring	1.32	.000	3.73	1.98	7.03
Google-class	0.86	.008	2.31	1.25	4.26
Both supports	1.46	.000	4.31	2.19	8.48
Received None	-	-	1.0	-	-

Source: Prepared by the researchers based on the outputs of the statistical program SPSS 25

## DISCUSSION AND RECOMMENDATIONS

Training is a tool to achieve the required competencies and enables to formulate employee potential (Gerds, 2010). Training effectiveness is a crucial aspect to determine the returns on investment (Noe, 2010). A lot of investment is being made by government and development partners on training of various levels of staff on different issues for strengthening health systems. However, it is important to see how far the knowledge and skills imparted through the training programmes are being sustained and used in their work situation.

This study suggests that providing training alone is not sufficient. Besides training, it is important that the participants are provided continuous support and handholding after the training. Such support is important to retain the knowledge and skills imparted during the trainings, and to bring about sustainable change in their practices using those learnings. Self-directed learning was also found to be an effective strategy but requires the use of interactive techniques that engage the learner. Self-directed learning has the additional advantage of allowing learners to study at their own pace, select times convenient for them and tailor learning to their specific needs.

The importance of repetitive exposure is supported in the literature. A review by Bluestone et.al. (2013) considered the effect of frequency, comparing single versus repetitive exposure. These studies evaluated the effect of repeated questions and targeted feedback. The evidence from these studies demonstrated that repetitive, time-spaced education exposures were more effective in terms of knowledge outcomes, enhanced retention and sounder clinical decisions as compared to the single exposure and live instruction. Bluestone et.al (2013) suggested that when possible, replace single-event frequency with targeted, repetitive training

that provides reinforcement of important messages, opportunities to practice skills and mechanisms for fostering interaction.

Our research suggests that systematic capacity building of data managers and health officials, along with constant support and handholding can improve the use of data for programme level decisions.

Organizations can use a variety of methods, both on-line and off-line. Methods using internet and digital technologies, such as e-learning and self-education, increasingly become popular learning process and basis for knowledge transfer (Nemec and Burak, 2018). A study by Zurovac et al. in Kenya revealed that using mobile phones for delivering repetitive reminders improved the case management of health care providers significantly, the such improvements retained for a period of more than 6-month. Evidence from some studies supports the use of computers for delivering instruction for knowledge and attitudes; however, limited evidence exists to support its use in changing practices behaviors (Ajami and Bartiani 2012). The profusion of information technology and increased access to technology present an opportunity to deliver in-service training in many new ways.

Our study suggests that both on-site handholding as well as support through the web-based Google-Class platform was found to be effective in knowledge retention and improving data use. Such methods are useful for the success of investment in capacity building initiatives in the health system.

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