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## **Taiwan and the World Health Assembly/World Health Organization: Perspectives from Health Services and Research**

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### **Abstract**

Despite being one of Asia's major economies with a population of over 23 million, Taiwan has been mostly excluded from the World Health Assembly/World Health Organization (WHA/WHO) since 1972, due to China's objection. While this has not stopped Taiwan from developing a comprehensive healthcare system and being an active member of international health community, the lack of membership in the world's leading health authority undermines global health and presents perverse, and yet often neglected, inequality faced by Taiwanese people. This article aims to provide contextual information concerning the impacts of Taiwan's exclusion from WHA/WHO by: (1) enumerating health-related areas where Taiwan has rich knowledge and experiences that would have been cascaded much more widely and efficiently to those in need around the world had it been allowed to participate; and (2) highlighting difficulties faced by Taiwanese people and potential threats to international health arising from the exclusion.

### **Keywords**

Taiwan; World Health Assembly; World Health Organization; international health; biomedical research; health policy

## **Background**

With a population of over 23 million, Taiwan is one of Asia's major economies. Despite being an active member of the international community in every respect, Taiwan has been excluded from the United Nations (UN) and its associated organisations since 1970s, when People's Republic of China gained the UN's recognition as the representative of China in place of the Republic of China. Among the many UN-associated organisations which provide leadership and promote collaboration in almost every aspect of international affairs is the World Health Organization (WHO), a specialised agency established in 1948 under the Charter of the UN with the objective of the 'attainment of all peoples of the highest possible level of health' and a guiding principle that this should be 'fundamental rights of every human being without distinction of race, religion, political belief, economic or social condition' (WHO, 2006). The World Health Assembly (WHA) is WHO's decision body. It is convened annually in Geneva and is attended by delegations from all WHO member states. The WHA appoints WHO's director-general, determines its policies and work programmes, supervises its finance, and provides a forum for discussion and debate of issues related to health.

The exclusion of Taiwan from the UN means it has also been excluded from the WHO, and by extension participation in the WHA. Despite repeated attempts by Taiwanese medical professions and government to obtain membership to WHO and to gain access to WHA, Taiwan was only allowed to participate in the WHA as an observer under the title of 'Chinese Taipei' between 2009 to 2012. Even such restricted access turned out to be short-lived and was conditional upon China's subjugation of Taiwan's status. This means Taiwan has been

prevented from joining the world's leading authority and prime forum for health, against its will, due to political reasons.

This article aims to provide contextual information with regard to the impacts of Taiwan's exclusion from the perspectives of health services and research—which both concern the promotion of health, the ultimate goal for WHO/WHA. Evidence on Taiwan's major contribution towards improving the health of its population and the wider world, despite its absence from WHA/WHO, is presented to illustrate the perverse restrictions that prevent Taiwan from officially participating in international health affairs, as well as to highlight areas where Taiwan could have more direct and wider contribution towards other countries. Attention is also drawn to the difficulties and threats that people in Taiwan face because of their exclusion from the WHO/WHA. Information included in this article is gathered from searches of biomedical and health sciences literature, supplemented by personal knowledge and experiences in academic research and healthcare policy, as well as by discussions of pertinent issues with colleagues. The intention is to provide a descriptive account of factual information directly related to health service provision and research to set the scene for further discourse of Taiwan's participation in the WHA/WHO. The author acknowledges the complex historical and sociopolitical issues surrounding Taiwan's membership for WHO/WHA, and it is beyond this article's remit to undertake in-depth analyses of empirical evidence to explicate reasons behind Taiwan's difficulties in obtaining membership, which warrants a separate endeavour. The author also deliberately refrains from delving into theoretical development and conceptual debates, which can be found in accompanying articles in this issue of the journal and elsewhere (see Herington & K. Lee, 2014; Hickey, 2006; K. Lee & Fang, 2016).

## **Taiwan and International Health**

Health is regarded as a human right as it affects every aspect of a person's life and well-being. Maintaining good health requires both: (1) sufficient socioeconomic resources to fulfil people's basic needs and to promote behaviours and an environment that have positive influences on determinants of health; and (2) a well-functioning healthcare system to prevent ill health and to help people recover from or manage illnesses when they occur. Taiwan's successful transformation from a low-income economy to one of the 'four little dragons' in Asia in the late twentieth century is a unique experience which can be shared with developing countries in its own right (Vogel, 1991). This article centres on issues directly related to health services and health research, which are most relevant to the function of the WHA/WHO.

Three topic areas are chosen as the focus of the narrative: health system and services; infectious disease control and prevention; and biomedical research. These topic areas are characterised by their major impact on health, the existence of substantial achievement made and ongoing challenges faced by people in Taiwan, and the inextricable relationship between Taiwan and rest of the world.

### **Taiwan's Health System and Services**

#### ***1. Universal Coverage of Healthcare***

Back in 1978, world leaders and health experts gathered in Almaty, Kazakhstan (formerly part of the USSR), and adopted the Declaration of Alma-Ata at the International Conference on Primary Health Care. The declaration affirmed that health is a fundamental human right and was considered as a major milestone in public health in the twentieth century. It

highlighted the gross inequality in the health status of people, particularly between developing and developed countries, and urged all countries to ‘collaborate in spirit of partnership’ (International Conference on Primary Health Care, 1978) and called for WHO, the United Nations International Children’s Emergency Fund (UNICEF), and governments and non-governmental organisations at all levels to take initiatives to support the development of primary healthcare that is accessible and affordable to all individuals and families when they need it. Forty years on, this noble aspiration remains a major challenge for many countries around the world. The UN has reaffirmed its commitment to facilitating universal health coverage in the Sustainable Development Goals it adopted in its General Assembly in 2015 (Tangcharoensathien, Mills, & Palu, 2015), and achievement of universal health coverage remains high on the global health agenda.

Taiwan introduced a National Health Insurance Program in 1995 when around 40 percent of its population had no health insurance coverage. The programme attained a population coverage beyond 90 percent in its first year and has subsequently reached and maintained a coverage of over 99 percent, with services characterised by high levels of overall patient satisfaction (over 80%), short waiting times, and flexibility for individuals to choose their service providers (National Health Insurance Administration, 2018a). More remarkably, these milestones have been accomplished with a relatively modest expenditure compared with other countries that have well-established healthcare systems. The total spending on health was equivalent to 6.6 percent of Taiwan’s gross domestic product in 2012; this is lower than 9.3 percent for the UK, 10.3 percent for Japan, and much lower than 16.9 percent for the US (T. Cheng, 2015; National Health Insurance Administration, 2016). This achievement has therefore drawn international attention as a good example that other countries could learn from (S. Cheng & Chiang, 1997; T. Cheng, 2003; Wen, Tsai, & Chung, 2008).

Notwithstanding these achievements, Taiwan's National Health Insurance Program also faces ongoing challenges, including the financial pressure associated with the rising costs of care for an ageing population with low fertility, and overworked healthcare workforce (T. Cheng, 2015; M. Yeh & H.-H. Chang, 2015). The exclusion from the WHA/WHO means that Taiwan was shut out of the world's prime forum for health policy to share this successful experience with other countries and to discuss solutions for common challenges.

## **2. *Traditional Chinese Medicine***

A unique feature of Taiwan's National Health Insurance Program is its inclusion of providers of both Western medicine and traditional Chinese medicine, with over 3,500 registered traditional Chinese medicine clinics (National Health Insurance Administration, 2018b). Although Western medicine has been the mainstream healthcare in Taiwan for decades, traditional Chinese medicine is practised and remains a popular option for many health conditions involving the respiratory, digestive, and genitourinary systems, as well as chronic pain (F. Chen, T. Chen, & Kung et al., 2007). The provision of Chinese medicine alongside Western medicine offers the Taiwanese population a wider choice to fulfil their health needs, but it has also raised some administrative and regulatory issues (H. Wang & C. Wang, 2018). As the WHO embraces traditional Chinese medicine by incorporating related terminology in the latest International Classification of Diseases 11th Revision (ICD-11) (Cyranoski, 2018), which is a widely adopted international standard for classifying and coding diseases and health-related problems, the practice and uptake of traditional Chinese medicine is set to continue spreading around the world. At the same time, scepticism regarding the effectiveness, safety, and mechanisms of action of traditional Chinese medicine remains among practitioners of evidence-based medicine (Cyranoski, 2018). Further dialogues between relevant stakeholders and collection of sound evidence from well-designed research

and real-life practice will be crucial to resolve uncertainties and ensure future development that maximises the population's health gain. The inclusion of both traditions of medical practice, education, and research in Taiwan's healthcare system will provide a unique opportunity for these activities (F. Chen et al., 2007). Indeed, a comprehensive database covering more than 20,000 pure compounds isolated from 453 traditional Chinese medicine ingredients has been created by Taiwanese researchers (C. Y. Chen, 2011).

### ***3. Migrant Health (Healthcare for Foreign Workers and Immigrants) and International Travel***

With an estimated 8.2 births per 1,000 of the population per year, Taiwan has one of the lowest birth rates in the world (Central Intelligence Agency, 2019). Coupled with a rapidly ageing population, there is a need for additional workforce that cannot be met by its native population in many sectors, including manufacturing, agriculture, and health and social care. Consequently, a sizeable population of foreign workers have come to work in Taiwan, primarily from neighbouring countries, including Indonesia, Vietnam, the Philippines, and Thailand. The number has been rising steadily from around 300,000 in 2003 to nearly 700,000 in 2018 (Ministry of Labor, 2018). In addition, hundreds of thousands of immigrants associated with international marriage, mostly women from mainland China and Southeast Asian countries, have settled in Taiwan since the late 1980s (Jones & Shen, 2008; Yang, H. Wang, & F. Lee et al., 2015). The healthcare needs of these foreign nationals and immigrants are covered by, and therefore dependent upon, the National Health Insurance Program previously mentioned.

Taiwan also has an active and growing tourism industry. In 2015 alone, there were over 10 million visitor arrivals, with over half arriving from mainland China, Hong Kong, or Macao;



over 1.6 million from Japan; 1.4 million from Southeast Asian countries; approximately 588,000 from the Americas; 274,000 from Europe; 90,000 from Oceania; and 10,000 from Africa (Tourism Bureau Ministry of Transport and Communication, 2016). In the same year, there were over 13 million outbound departures by citizens of Taiwan, with Japan (3.7 million), mainland China (3.4 million), and Hong Kong (2 million) being the most frequent first destinations. The large volume of international air travel has major implications on Taiwan's need to be an indispensable member of the international network for communicable disease surveillance and control, as described later in this paper.

## **Infectious Disease Control and Prevention**

### ***1. Viral Hepatitis***

Chronic liver diseases associated with viral infection remain a major public health challenge. It was estimated that in 2015 alone viral hepatitis caused 1.34 million deaths worldwide—an impact on mortality similar to that of tuberculosis and greater than HIV (WHO, 2017). The burden of the hepatitis B virus (HBV) infection is particularly high in Africa and Eastern Asia/Western Pacific regions. Taiwan has led the way in research to combat HBV. An early population study from Taiwan back in the 1980s established the strong link between the HBV infection and liver cancer (Beasley, C. Lin, & Hwang et al., 1981). A mass vaccination programme, firstly targeted at infants of mothers who were HBV carriers, also demonstrated its feasibility (D. Chen, N. Hsu, & J.-L. Sung et al., 1987) and effectiveness (H. Hsu, D. Chen, & C. Chuang et al., 1988). This was followed by successive expansions of the immunisation programme to cover all neonate, children of older ages and eventually adults, with a corresponding reduction in population incidence of the hepatitis B viral infection (H. Chen, M. Chang, & Ni et al., 1996; Ni, L. Huang, & M. Chang et al., 2007) and liver cancer

(M. Chang, C. Chen, & Lai et al., 1997) clearly documented. Backed by the strong evidence, mass immunisation programmes were subsequently adopted by many other countries and were recommended by the WHO (WHO, 2017). Taiwan is now stepping up its effort to eliminate hepatitis C (G. Wu, Pwu, & S. Chen, 2018), another major threat to public health highlighted by the WHO.

## 2. *Influenza*

Influenza causes discomforting symptoms and may lead to severe illness, particularly among vulnerable groups such as very young children, pregnant women, the elderly, and people with chronic health conditions (WHO, 2012). It is estimated to be associated with approximately between 290,000 to 650,000 deaths globally each year (Iuliano, Roguski, & H. Chang et al., 2018). The disease, caused by a family of influenza viruses, is difficult to contain as it can be spread easily through droplets carrying the virus, which are spread into the air by coughs and sneezes. The contagiousness combined with the high level of morbidity and mortality associated with influenza, including infrequent but potentially devastating pandemic outbreaks, make its prevention and control a high priority. Prompt identification and effective quarantine and isolation of the infected person remain the key measures to contain the disease and its impact. In order to address this major global challenge, the WHO has coordinated a Global Influenza Surveillance and Response System (formerly known as Global Influenza Surveillance Network) since 1952 (WHO, 2019).

Although influenza vaccines have been developed, the protection conferred by these vaccines varies by year and location because of the high level of genetic mutation of the viruses (WHO, 2012). The advice on vaccine composition is issued yearly following consultation with members of WHO Collaborating Centres on Influenza and Essential Regulatory

Laboratories. Manufacturers of influenza and many other vaccines also rely on the supply of certified 'reference viruses' and reagents for vaccine standardisation. Despite being one of the first Asian countries to qualify for the membership of the Pharmaceutical Inspection Co-operation Scheme (PIC/S), a leading organisation for international development, implementation, and maintenance of harmonised Good Manufacturing Practice standards concerning medicinal products, Taiwan's lack of WHO membership means site visits and certification by WHO cannot be arranged. It also means that the vaccines it is capable of producing cannot be sent to other countries in need to ease vaccine shortage. These have important public health implications for the preparedness of pandemic influenza.

### **3. *Severe Acute Respiratory Syndrome***

While influenza has been an ongoing, major threat to public health, serious illnesses caused by other contagious viruses have emerged since the turn of the new millennium. The severe acute respiratory syndrome (SARS) caused by a coronavirus is an example that underscores the unprecedented challenge that health authorities around the world face in an era when a disease can be carried and spread from one country to another country thousands of miles away within a day. The case of SARS also vividly illustrated the adversity and hardship that people in Taiwan experienced when they faced the emergence of such a terrifying condition without having direct access to the WHO, an organisation that was set up to deal with very situations like this.

Since November 2002, cases of an atypical pneumonia started to appear in China's southern province of Guangdong (Zhong, Zheng, & Li et al., 2003). A major outbreak of similar cases occurred in March 2003 in neighbouring Hong Kong, from where the disease was believed to have further spread to other countries including Singapore, Vietnam, and Taiwan in Southeast

Asia, and as far as Canada within a month (Hui & J. Sung, 2003). Faced with a hitherto unknown disease spreading rapidly around the world and causing serious illness and deaths, the WHO issued a global alert on 12 March 2003 and coordinated global collaborative networks to identify the underlying pathogen, develop tools for its diagnosis, survey ongoing and new cases, explore treatment options, and contain the further spread of the disease (WHO, 2003). Within a few weeks, a new coronavirus was identified as the cause of the disease. Advice for international travel and screening of suspected cases was issued, and a global surveillance system for the disease was proposed. Outbreaks in various countries and regions peaked and were brought under control in the following months. By July 2003, the WHO announced that the last person-to-person chain of transmission of the SARS virus had been broken following removal of Taiwan from its list of areas with recent local transmission (Drosten, Lau, & Preiser et al., 2003). Overall, over 8,000 cases of SARS leading to more than 700 deaths were reported worldwide, but fortunately, the phenomenal global effort seems to have prevented the much worse scenario that had been anticipated.

Behind this success story, however, was the struggle for healthcare practitioners, researchers, and governmental officials in Taiwan, which suffered from the third largest outbreak after China and Hong Kong. They sought to join the collaborative networks set up by WHO and to obtain direct, timely access to crucial information, samples, and diagnostic materials without success due to Taiwan's lack of WHO membership (Cyranoski, 2003). Researchers from Taiwan spoke of their frustration as they were unable to participate in the meetings between WHO's Collaborating Centres and had to rely on information made available on WHO's website: 'By the time the information is in the public domain, it's probably out of date' (Cyranoski, 2003: 652). While Taiwan was able to obtain some assistance through unofficial routes from other international allies in the end, it was delayed by several weeks (Hickey,

2006). This was in contrast with the very purpose behind the international collaborative networks: ‘In outbreak alert and response, *every hour counts*, as the window of opportunity for preventing deaths and further spread closes quickly’ (World Health Organization Communicable Disease Surveillance and Response, 2003, emphasis added). Since the outbreak of SARS, further emerging viral diseases such as Middle East Respiratory Syndrome, Ebola, and Zika have hit news headlines and caused major concerns. In each case, collaborative international effort has undoubtedly contributed to the rapid identification of the cause and mechanisms of the diseases, the identification of new cases, and strategies for their treatment and prevention. Taiwan’s exclusion from key official organisations and networks associated with these functions presents an important threat to the international effort in controlling the risk posed by emerging infectious diseases, which not only threaten human health, but have far-reaching social and economic impacts (C. Ko, C. Yen, & J. Yen et al., 2006; Qiu, Chu, & Mao et al., 2018).

### **Biomedical Research**

Taiwan is an active member of the medical and health research community and has made a steady contribution towards the world’s biomedical literature. As a broad indicator, a keyword search of ‘Taiwan’ in PubMed yielded over 14,000 records indexed for 2017 alone. Researchers from Taiwan participated in landmark international collaborations such as the Global Burden of Disease Study (GBD 2013 Mortality and Causes of Death Collaborators, 2015) that examined the prevalence and incidences of different diseases and their impact on morbidity and mortality across the globe. They also participated in the International HapMap Project (International Hapmap Consortium, 2003), which investigated common patterns of variation in DNA sequences in the human genome and made the information publicly available.

In the era of ‘big data’, the potential to learn from patterns and trends arising from the enormous amounts of data generated and stored in electronic formats (such as electronic hospital records and health insurance databases) and to use this information to advance science has been highlighted in many fields, including medical and health sciences. Taiwan has taken advantage of a nationwide information system established for the aforementioned National Health Insurance Program and created a National Health Insurance Research Database (NHIRD), which is one of the largest nationwide databases in the world (Y. Chen, H. Yeh, & J. Wu et al., 2011). The NHIRD allows linkage with other national databases such as those pertaining to household registry, birth/death certification, and cancer, and thus provides a unique resource for medical and health services research that few databases from other countries could match (Hsing & Ioannidis, 2015).

While Taiwanese researchers and health professionals have strived for and have largely enjoyed full participation in international academic societies and meetings, political interferences have threatened their dignity and involvement, amid the Chinese government’s effort to suppress Taiwan’s international presence (MOFA, 2018a; Strong, 2017). As illustrated earlier in the case of SARS, Taiwanese delegates, including scholars, have faced substantial hurdles in order to participate in technical meetings organised by WHO and related institutions. Under current practice (in which Taiwan has no say), Taiwan’s requests to WHO for participation are routed to China and are subject to its ‘approval’. Delays and rejections are common (MOFA, 2018a), and these severely hamper Taiwan’s involvement in decision-making related to global health and exchange of technical expertise with international partners.

### **Other Areas Related to Health**

The examples described above represent a small proportion of aspects among a vast number of the medical and health-related issues and activities that people in Taiwan engage with locally and globally on a daily basis. For example, Taiwan was among the first countries in Asia to introduce legislation related to sexual offences and domestic violence, and its efforts in health promotion has produced good results in the reduction of tobacco smoking and areca (betel) nut use. Areca nut use is strongly associated with oral cancer and is an important public health issue in several South Asian and Western Pacific countries. Taiwanese researchers have made a major contribution in understanding its epidemiology (C. Lee, A. Ko, & Warnakulasuriya et al., 2012) and in studying its negative health effects (Y. Ko, Y. Huang, & C. Lee et al., 1995; C. Lee, J. Lee, & D. Wu et al., 2005). Taiwan endures fierce typhoons (tropical storms) almost every year and has experienced several devastating earthquakes in the past. It therefore has local expertise in emergency response (including healthcare) to natural disasters that could be shared, but at the same time there are also unpredictable but urgent needs for Taiwan to receive help from other nations when these events strike. Taiwan's timely reception and offering of such assistance from and to other countries has been hampered in several humanitarian crises by the lack of WHO membership in association with China's objection (Hickey, 2006).

With its good economic standing, Taiwan has made substantial financial contributions towards international cooperation and development in many parts of the world. In 2017 alone the amount exceeded US\$321 million, including over US\$24 million related to health and medical care and over US\$28 million towards emergency humanitarian aids (MOFA, 2018b). While a large proportion of these funds was contributed to the small number of countries which have maintained an official tie with Taiwan, assistance related to health offered by

both the Taiwanese government and non-governmental organisations has covered well over 70 countries around the world (Hickey, 2006), with recent examples including health emergencies such the Ebola outbreak (K. Lee & Fang, 2016) and ongoing training for healthcare providers from developing countries (for example, through the Taiwan International Healthcare Training Center). Charitable organisations, in collaboration with volunteer health professionals from Taiwan, regularly tour remote villages and deprived communities worldwide to provide humanitarian aid and free healthcare. In the past, Taiwan has suffered from environmental pollutions that have had direct adverse consequences for health during the period of rapid economic growth; important studies on environmental arsenic exposure were published on the basis of this unfortunate experience (C. Chen, L. Hsu, & H. Chiou et al., 2004; C. Chen, Y. Chuang, & T. Lin et al., 1985; H. Chiou, S. Chiou, & Y. Hsu et al., 2001). Taiwan is also not immune from the recent resurgence of dengue fever, a disease transmitted through mosquito bites that could be life-threatening (in its severe forms) and that has posed major threats in many Asian and Latin American countries (WHO, 2018). Many of the above issues are high on WHA's agenda, and they further illustrate that Taiwan has a lot to give, to receive, and to share in terms of promoting health just like any other countries.

## **Conclusion**

Despite having a population larger than that of two-thirds of the member states of the WHO, Taiwan continues to be excluded from this pivotal organisation, which leads and coordinates international efforts to improve global health, due to political reasons. This situation is in sharp contrast with the principle enshrined by the WHO in its 1946 Constitution: 'the highest attainable standard of health as a fundamental right of *every* human being' (WHO, 2006, emphasis added). This article has described how Taiwan has contributed to the advance of



medical and health services and research both locally and internationally during the decades of its exclusion from the WHA/WHO. Judging from the substantial achievement, it may appear, on the surface, that Taiwan's lack of official recognition and membership has not had much negative impact on its ability to promote health and to interact with the international community. However, as highlighted in the cases here, difficulties are frequently encountered by Taiwanese officials (and increasingly by Taiwanese scholars) in relation to participation in international meetings, and crucial international support has been delayed or unavailable during emergency situations because of the lack of a direct, official channel to communicate with the WHO. In addition to the disadvantages and real threats towards health that are posed to people who live in and/or who have connection with Taiwan, its exclusion from the WHA/WHO has also led to many missed opportunities for Taiwan to share its social and economic resources and its rich experiences in creating advanced technologies and tackling health-related issues with the international community in a timely and efficient manner. The 'default' position of being excluded from WHO/WHA-related activities over the decades might have also resulted in less apparent but more profound disadvantages for Taiwanese officials, health professionals, and scholars in terms of restricting their exposures to latest developments and training opportunities related to health sciences, technologies, and effective interventions, and limiting their vision in contemporary global health affairs and policy. As a past secretary of US Department of Health and Human Services put it, 'the people of Taiwan deserve the same level of public health as citizens of every nation on earth' (F. Lin, 2003). It is questionable why their basic entitlements are deprived despite the previously described contributions that they have made towards global health.

In this close-knit modern world in which people, commodities (including foods and medicines), and information, as well as pathogens and pollutants, can move swiftly from one

part of the globe to another, the exclusion of Taiwan from WHA/WHO has impacts far beyond its own land and people, and should be a shared concern for all. Indeed, the international medical community has repeatedly voiced their concerns of the exclusion of Taiwan from the WHA/WHO ('Not on the List', 2017; 'Taiwan: Time to End the Exile', 1999; World Medical Association, 2005). Due attention and support from the international community, as well as efforts from authorities on both sides of the Taiwan straits to forge a shared wisdom for the resolution of the unfortunate political situation shaped by past history, would be required to overcome the impasse and to enable Taiwan's unconditional participation in this top health authority of the world. This would be consistent with the principle of health as a human right for all, and encourage global collaboration in health service delivery and health research, including those between Taiwan and mainland China that have already been occurring ('Unchartered Territory', 2011).

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### **References**

Beasley, Palmer; Lin, Chia-Chin; Hwang, Lu-Yu et al. (1981) 'Hepatocellular carcinoma and hepatitis B virus: A prospective study of 22 707 men in Taiwan', *The Lancet* 2(8256): 1129–1133.

Central Intelligence Agency (2019) 'The world factbook country comparison: Birth rate', Retrieved 19 July 2019 from <https://www.cia.gov/library/publications/resources/the-world-factbook/fields/345rank.html>.

Chang, Mei-Hwei; Chen, Chien-Jen; Lai, Mei-Shu et al. (1997) 'Universal hepatitis B vaccination in Taiwan and the incidence of hepatocellular carcinoma in children', *New England Journal of Medicine* 336(26): 1855–1859.

Chen, Calvin Yu-Chian (2011) 'TCM Database@Taiwan: The world's largest traditional Chinese medicine database for drug screening in silico', *PLoS ONE* 6(1): e15939.

Chen, Chi-Ling; Hsu, Lin-I; Chiou, Hung-Yi et al. (2004) 'Ingested arsenic, cigarette smoking, and lung cancer risk: A follow-up study in arseniasis-endemic areas in Taiwan', *Journal of the American Medical Association* 292(24): 2984–2990.

Chen, Chien-Jen; Chuang, Ya-Chien; Lin, Tong-Ming et al. (1985) 'Malignant neoplasms among residents of a blackfoot disease-endemic area in Taiwan: High-arsenic artesian well water and cancers', *Cancer Research* 45(11): 5895–5899.

Chen, Ding-Shinn; Hsu, Nora Hsu-Mei; Sung, Juei-Low et al. (1987) 'A mass vaccination program in Taiwan against hepatitis B virus infection in infants of hepatitis B surface antigen-carrier mothers', *Journal of the American Medical Association* 257(19): 2597–2603.

Chen, Fang-Pey; Chen, Tzeng-Ji; Kung, Yen-Ying et al. (2007) 'Use frequency of traditional Chinese medicine in Taiwan', *BMC Health Services Research* 7: 26.

Chen, Huey-Ling; Chang, Mei-Hwei; Ni, Yen-Hsuen et al. (1996) 'Seroepidemiology of hepatitis B virus infection in children: Ten years of mass vaccination in Taiwan', *Journal of the American Medical Association* 276(11): 906–908.

Chen, Yu-Chun; Yeh, Hsiao-Yun; Wu, Jau-Ching et al. (2011) 'Taiwan's National Health Insurance Research Database: Administrative health care database as study object in bibliometrics', *Scientometrics* 86(2): 365–380.

Cheng, Shou-Hsia and Chiang, Tung-Liang (1997) 'The effect of universal health insurance on health care utilization in Taiwan: Results from a natural experiment', *Journal of the American Medical Association* 278(2): 89–93.

Cheng, Tsung-Mei (2003) 'Taiwan's new national health insurance program: Genesis and experience so far', *Health Affairs* 22(3): 61–76.

Cheng, Tsung-Mei (2015) 'Reflections on the 20th anniversary of Taiwan's single-payer National Health Insurance System', *Health Affairs* 34(3): 502–510.

Chiou, Hung-Yi; Chiou, Shu-Ti; Hsu, Yi-Hsiang et al. (2001) 'Incidence of transitional cell carcinoma and arsenic in drinking water: A follow-up study of 8,102 residents in an arseniasis-endemic area in northeastern Taiwan', *American Journal of Epidemiology* 153(5): 411–418.

Cyranoski, David (2003) 'Taiwan left isolated in fight against SARS', *Nature* 422: 652.

Cyranoski, David (2018) 'The big push for Chinese medicine', *Nature* 561: 448–450.

Drosten, Christian; Lau, Arthur Chun-Wing; Preiser, Wolfgang et al. (2003) 'Timeline', in Bernd Sebastian Kamps and Christian Hoffmann (eds), *SARS Reference – 10/2003*.

*SARSReference.com*, Flying Publisher, 15–29. Retrieved 28 March 2018 from

<http://sarsreference.com/sarsreference.pdf>.

GBD 2013 Mortality and Causes of Death Collaborators (2015) 'Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: A systematic analysis for the Global Burden of Disease Study 2013', *The Lancet* 385(9963): 117–171.

Herington, Jonathan and Lee, Kelley (2014) 'The limits of global health diplomacy: Taiwan's observer status at the world health assembly', *Global Health* 10: 71.

Hickey, Dennis (2006) 'The high cost of excluding Taiwan from the WHO', in Edward Friedman (ed), *China's Rise, Taiwan's Dilemmas and International Peace*, Abingdon, Oxon: Routledge, 68–84.

Hsing, Ann and Ioannidis, John (2015) 'Nationwide population science: Lessons from the Taiwan National Health Insurance Research Database', *JAMA Internal Medicine* 175(9): 1527–1529.

Hsu, Hsu-Mei; Chen, Ding-Shinn; Chuang, Cheng-Hua et al. (1988) 'Efficacy of a mass hepatitis B vaccination program in Taiwan: Studies on 3464 infants of hepatitis B surface antigen-carrier mothers', *Journal of the American Medical Association* 260(15): 2231–2235.

Hui, David and Sung, Joseph (2003) 'Severe acute respiratory syndrome', *Chest* 124(1): 12–15.

International Conference on Primary Health Care (1978) 'Declaration of Alma-Ata',  
International Conference on Primary Health Care, Alma-Ata, USSR. Retrieved 25 September  
2018 from [http://www.who.int/publications/almaata\\_declaration\\_en.pdf](http://www.who.int/publications/almaata_declaration_en.pdf).

International HapMap Consortium (2003) 'The International HapMap Project', *Nature* 426:  
789.

Iuliano, A. Danielle; Roguski, Katherine M.; Chang, Howard H. et al. (2018) 'Estimates of  
global seasonal influenza-associated respiratory mortality: A modelling study', *The Lancet*  
391(10127): 1285–1300.

Jones, Gavin and Shen, Hsiu-hua (2008) 'International marriage in East and Southeast Asia:  
Trends and research emphases', *Citizenship Studies* 12(1): 9–25.

Ko, Chih-Hung; Yen, Cheng-Fang; Yen, Ju-Yu et al. (2006) 'Psychosocial impact among the  
public of the severe acute respiratory syndrome epidemic in Taiwan', *Psychiatry and Clinical  
Neurosciences* 60(4): 397–403.

Ko, Ying-Chin; Huang, Yung-Li; Lee, Chien-Hung et al. (1995) 'Betel quid chewing,  
cigarette-smoking and alcohol-consumption related to oral-cancer in Taiwan', *Journal of  
Oral Pathology & Medicine* 24(10): 450–453.

Lee, Chien-Hung; Ko, Albert Min-Shan; Warnakulasuriya, Saman et al. (2012) 'Population  
burden of betel quid abuse and its relation to oral premalignant disorders in South, Southeast,

and East Asia: An Asian betel-quid consortium study’, *American Journal of Public Health* 102(3): e17–24.

Lee, Chien-Hung; Lee, Jang-Ming; Wu, Deng-Chyang et al. (2005) ‘Independent and combined effects of alcohol intake, tobacco smoking and betel quid chewing on the risk of esophageal cancer in Taiwan’, *International Journal of Cancer* 113(3): 475–482.

Lee, Kelley and Fang, Jennifer (2016) ‘Challenges and opportunities for Taiwan’s global health diplomacy’, Brookings Institution. Retrieved 28 March 2018 from <https://www.brookings.edu/opinions/challenges-and-opportunities-for-taiwans-global-health-diplomacy/>.

Lin, Fang-yan (2003) ‘We want WHO membership, not SARS’, *Taiwan Journal*, 4 April, p. 1.

Ministry of Foreign Affairs (MOFA) (2018a) ‘中國大陸阻撓我國國際空間事例’ [Incidents of mainland China’s interference with Taiwan’s international space], Ministry of Foreign Affairs, Republic of China (Taiwan). Retrieved 24 March 2019 from [https://www.mofa.gov.tw/Content\\_List.aspx?n=442A97CFB4A0C56C](https://www.mofa.gov.tw/Content_List.aspx?n=442A97CFB4A0C56C).

MOFA (2018b) ‘國際合作發展事務106年度報告’ [International cooperation and development report 2017], Ministry of Foreign Affairs, Republic of China (Taiwan). Retrieved 19 June 2019 from [https://www.mofa.gov.tw/News\\_Content\\_M\\_2.aspx?n=A30D6E978846B3C0&sms=BA727B25FD99C6CC&s=CD25E4C1B455F119](https://www.mofa.gov.tw/News_Content_M_2.aspx?n=A30D6E978846B3C0&sms=BA727B25FD99C6CC&s=CD25E4C1B455F119).



Ministry of Labor (2018) 'Foreign workers', Ministry of Labor, Republic of China (Taiwan), 20 September. Retrieved 13 October 2018 from <http://statdb.mol.gov.tw/html/mon/i0120020620e.htm>.

National Health Insurance Administration (2016) '2015–2016 全民健康保險年報' [2015–2016 National Health Insurance Annual Report], National Health Insurance Administration, Ministry of Health and Welfare (Taiwan). Retrieved 21 March 2018 from [http://www1.nhi.gov.tw/Nhi\\_E-LibraryPubWeb/CustomPage/Periodical.aspx?FType=8](http://www1.nhi.gov.tw/Nhi_E-LibraryPubWeb/CustomPage/Periodical.aspx?FType=8).

National Health Insurance Administration (2018a) '2017-2018 全民健康保險年報' [2017–2018 National Health Insurance Annual Report], National Health Insurance Administration, Ministry of Health and Welfare (Taiwan). Retrieved 21 March 2018 from [http://www1.nhi.gov.tw/Nhi\\_E-LibraryPubWeb/CustomPage/Periodical.aspx?FType=8](http://www1.nhi.gov.tw/Nhi_E-LibraryPubWeb/CustomPage/Periodical.aspx?FType=8).

National Health Insurance Administration (2018b) 'National Health Insurance Annual Statistical Report 2017', National Health Insurance Administration, Ministry of Health and Welfare (Taiwan). Retrieved 28 October 2018 from [https://www.nhi.gov.tw/English/Content\\_List.aspx?n=0D39BCF70F478274&topn=616B97F8DF2C3614](https://www.nhi.gov.tw/English/Content_List.aspx?n=0D39BCF70F478274&topn=616B97F8DF2C3614) [in both Chinese and English].

Ni, Yen–Hsuan; Huang, Li–Min; Chang, Mei–Hwei et al. (2007) 'Two decades of universal hepatitis B vaccination in Taiwan: Impact and implication for future strategies', *Gastroenterology* 132(4): 1287–1293.

‘Not on the list’ (2017) [Editorial], *Nature* 545(25 May): 385.

Qiu, Wuqi; Chu, Cordia; Mao, Ayan et al. (2018) ‘The impacts on health, society, and economy of SARS and H7N9 outbreaks in China: A case comparison study’, *Journal of Environmental and Public Health*. <https://doi.org/10.1155/2018/2710185>.

Strong, Matthew (2017) ‘China threatens Taiwan Medical Association with name change: doctor; Beijing threatens not to host 2021 WMA General Assembly’, *Taiwan News*, 15 October. Retrieved 15 October 2017 from <https://www.taiwannews.com.tw/en/news/3274810>.

‘Taiwan: Time to end the exile’ (1999) [Editorial], *The Lancet* 354(9196): 2093.

Tangcharoensathien, V.; Mills, A.; and Palu, T. (2015) ‘Accelerating health equity: The key role of universal health coverage in the Sustainable Development Goals’, *BMC Medicine* 13: 101.

Tourism Bureau Ministry of Transport and Communication (2016) ‘Annual statistical report on tourism 2015’, Ministry of Transport and Communication (Taiwan). Retrieved 1 November 2018 from <http://211.79.207.171/ebook/A20013544.pdf>.

‘Uncharted territory’ (2011) [Editorial], *Nature* 478: 285.

Vogel, Ezra (1991) *The Four Little Dragons: The Spread of Industrialization in East Asia*, Cambridge, MA: Harvard University Press.

Wang, Hui-Po and Wang, Chun-Li (2018) 'Risk undermined in the bilateral pharmaceutical regulatory system in Taiwan', *Journal of Food and Drug Analysis* 26(2 Supplement): S3–S11.

Wen, Chi Pang; Tsai, Shan Pou; and Chung, Wen-Shen Isabella (2008) 'A 10-year experience with universal health insurance in Taiwan: Measuring changes in health and health disparity', *Annals of Internal Medicine* 148(4): 258–267.

World Health Organization (WHO) (2003) 'The operational response to SARS', WHO, 16 April. Retrieved 31 October 2018 from [http://www.who.int/csr/sars/goarn2003\\_4\\_16/en/](http://www.who.int/csr/sars/goarn2003_4_16/en/).

WHO (2006) 'Constitution of the World Health Organization', WHO. Retrieved 15 June 2019 from [https://www.who.int/governance/eb/who\\_constitution\\_en.pdf](https://www.who.int/governance/eb/who_constitution_en.pdf).

WHO (2012) 'Vaccines against influenza WHO position paper, November 2012', *Weekly Epidemiological Record* 87: 461-476.

WHO (2017) 'Global hepatitis report, 2017, WHO. Retrieved 14 October 2018 from <https://www.who.int/hepatitis/publications/global-hepatitis-report2017/en/>.

WHO (2018) 'Dengue and severe dengue', WHO, 13 September. Retrieved 31 October 2018 from <https://www.who.int/news-room/fact-sheets/detail/dengue-and-severe-dengue>.

WHO (2019) 'Global Influenza Surveillance & Response System (GISRS)', WHO. Retrieved 1 April 2019 from

[http://www.who.int/influenza/gisrs\\_laboratory/updates/gisrs\\_one\\_pager/en/](http://www.who.int/influenza/gisrs_laboratory/updates/gisrs_one_pager/en/).

World Health Organization Communicable Disease Surveillance and Response (2003)

'Severe acute respiratory syndrome (SARS): Status of the outbreak and lessons for the immediate future', WHO, 20 May. Retrieved 31 October 2018 from

[https://www.who.int/csr/media/sars\\_wha.pdf](https://www.who.int/csr/media/sars_wha.pdf).

World Medical Association (2005) 'WMA Council Resolution on observer status for Taiwan to the World Health Organization (WHO) and inclusion as participating party to the International Health Regulations (IHR)', WMA. Retrieved 1 November 2018 from

<https://www.wma.net/policies-post/wma-council-resolution-on-observer-status-for-taiwan-to-the-world-health-organization-who-and-inclusion-as-participating-party-to-the-international-health-regulations-ih/>.

Wu, Grace Hui-Min; Pwu, Raoh-Fang; and Chen, Shih-Chung (2018) 'Achieving hepatitis C elimination in Taiwan: Overcoming barriers by setting feasible strategies', *Journal of the Formosan Medical Association* 117(12): 1044–1045.

Yang, Yung-Mei; Wang, Hsiu-Hung; Lee, Fang-Hsin et al. (2015) 'Health empowerment among immigrant women in transnational marriages in Taiwan', *Journal of Nursing Scholarship* 47(2): 135–142.

Yeh, Ming-Jui and Chang, Heng-Hao (2015) 'National Health Insurance in Taiwan', *Health Affairs* 34(6): 1067.

Zhong, N. S.; Zheng, B. J.; Li, Y. M. et al. (2003) 'Epidemiology and cause of severe acute respiratory syndrome (SARS) in Guangdong, People's Republic of China, in February, 2003', *The Lancet* 362(9393): 1353–1358.