Tuberculosis, The Disease of The Poor: How COVID-19 Worsens TB Social Determinants and Role of Community Health Workers in Solving It

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Summary

Tuberculosis (TB) is a global health burden that countries commit to ending through the adoption of the "2030 WHO's End TB Strategy". However, the emergence of COVID-19 has exacerbated the effect of poverty, as the main social determinant of TB, on the vulnerability of rural communities to TB infection and mortality. COVID-19 caused job losses and wage decline, worsening malnutrition, access to healthcare services, and stigma towards TB patients amongst people experiencing poverty. To address this, WHO encourages the implementation of a community-based intervention, which provides a people-centered TB care model. Community Health Workers (CHWs) are important in TB healthcare service, from prevention and diagnosis to treatment. However, lack of support, financial incentives, and COVID-19 physical restrictions hinder CHW healthcare delivery. Therefore, improving health financing mechanisms for TB, improving training and support systems for CHW, and mainstreaming Health-in-All-Policies are needed to strengthen community-based intervention.

Tuberculosis (TB) is the 13th leading cause of death and the second leading infectious killer after COVID-19 worldwide (WHO, 2022). As it is considered a global health burden, countries around the globe have shown their commitment to ending TB through the adoption of the "2030 WHO's End TB Strategy" and the inclusion of The End TB Strategy in the UN Sustainable Development Goals. In the fight against TB, however, most countries are facing hindrances in providing the needed resources and creating appropriate programs for effective and efficient TB programs. Moreover, the recent COVID-19 pandemic heightens the complexity of TB eradication efforts. A few studies have mentioned COVID-19 and TB as a "twin epidemic" due to their similar clinical outcomes, which not only boost the detrimental effects of each other but also share and require similar healthcare services (Udita et al., 2020). Thus, many of TB's diagnostic tools, human resources, and financial resources were reallocated to COVID-19 healthcare services during the pandemic. The reallocation of resources was one of the reasons which caused a global drop of 18% in the reported number of people newly diagnosed with TB from 2019 (7.1 million) to 2020 (5.8 million), with Indonesia being the second largest contributor after India (WHO, 2022).

Aside from that, TB is often associated with being more prevalent in low-income societies—as poverty is considered a powerful determinant of TB (WHO, 2023). The presence of COVID-19 has increased the proportion of people living in poverty and the chance of people falling below the poverty line (WHO, 2023). In Indonesia, COVID-19 has caused an increase in the rate of unemployment by 6.03%, a decline in average wage by up to 17.28%, and an increase in the rate of poverty in rural areas by 4.42% in August 2020 compared to August 2019 (Tulus et al., 2021; Sri et al., 2022). COVID-19 has also caused a decrease in countries' GDP per capita, which worsens other social determinants of health (SDoH) of TB (Visca et al., 2021; WHO, 2023), such as health literacy, infrastructure and access to healthcare services, food insecurity, housing, and environmental conditions. To overcome these challenges, 88% of the eligible countries worldwide have implemented community-based activities (WHO, 2023). WHO defines community-based activities as activities conducted outside the premises of formal health

facilities (e.g., hospitals and clinics) in community-based structures and homesteads, carried out by health workers and community volunteers, who can be supported by non-governmental organizations and/or the government (WHO, 2018). This article will discuss how community health workers (CHWs) play a role in providing community and patient-centered healthcare to improve healthcare in rural areas most affected by the COVID-19 pandemic.

How does COVID-19 worsen the TB burden among people experiencing poverty?

There are two categories of how COVID-19 worsens access to TB healthcare services in rural areas: supply side and demand side.

From the supply side, COVID-19 physical restrictions have made it harder for rural communities to seek care with the already inadequate road networks and long distances to health facilities as there is a lack of transport available, especially in rural areas, limitation of the number of passengers allowed in public transport, and early closing of health facilities (Klinton et al., 2021; Lakoh et al., 2021; Recuero et al., 2021; Roberts et al., 2021; Santos et al., 2021; Soko et al., 2021). The supply chain of diagnostic tools and drugs is also hindered, causing an increase in medical fees, which is an extra burden for a household with limited income. Due to the reallocating of resources to COVID-19 healthcare services, there is a reduction of training, financial incentives, personal protective equipment, and workforce for healthcare practitioners (HCPs) working on TB programs, causing a lack of motivation to deliver TB care to patients. As a result, HCPs may be unable to foster patient-provider interaction and trust, which is important to improve patients' openness and adherence to medications. Some patients then switch to traditional healing practices and self-medication without medical prescriptions based on their norms and values, which may cause delayed treatment. Since TB and COVID-19 have similar clinical aspects, COVID-19 also affects the uneven and late distribution of TB laboratory reagents, medications, and rooms for patients, which may cause overcrowding and add to people's fear of COVID-19 transmission (Duarte et al., 2022; Formenti et al., 2022; Franke et al., 2022).

From the demand side, patients in rural areas tend to have low health literacy, which causes several challenges. First, limited knowledge of TB's clinical aspects may cause enacted stigma towards TB patients—the act of discrimination towards them prevent patients from seeking social interaction—which causes a psychological disease burden. Some patients fear stigmatization by health workers, causing them to withhold personal information needed for contact tracing or follow-up by CHWs. With COVID-19 having similar symptoms to TB, there may be an increased stigma towards TB patients as they are mistakenly perceived as getting COVID-19 (Franke et al., 2022; WHO, 2023). Second, HCPs may be burdened with more duties of conducting socialization activities through door-to-door visits—as public gatherings are prohibited—when they are not given enough financial incentives. Third, poor communities may live in overcrowded and unsanitized housing environments, which may increase the potential of TB transmission and cause TB to rebound when COVID-19 restrictions are lifted (Duarte et al., 2022; Formenti et al., 2022; Franke et al., 2022).

COVID-19 restrictions and economic consequences also cause food insecurity due to financial burdens and travel barriers to buying food. Even though patients are aware of the foods they need to consume, they tend to feel burdened by the nutrition guidelines given by health workers. Due to increasing food prices during the pandemic, added to the price needed to deliver these foods to people's homes, high-income societies have easier access to healthy foods. Some children whose screen time increased during the lockdown were also more interested in foods advertised on social media or TV, increasing demands away from home-cooked meals, which tend to be healthi-

er (Oyedolapo et al., 2022). Malnutrition is another SDoH related to TB, especially worsening its side effects (Franke et al., 2022). Predictive models suggest that undernutrition may increase the prevalence of childhood mortality as an indirect effect of COVID-19 by 18-23% (Anthony et al., 2021).

COVID-19 also exacerbates the existing extra burden carried by female TB patients more than those who are men. Those whose work may be terminated during the pandemic may be more vulnerable to domestic violence, hence prioritizing work over their care (Sobin et al., 2021). Due to food insecurity, they may compromise nutritious food for the rest of the family members or the time to visit a healthcare facility. Last but not least, during the pandemic, many countries implement online healthcare services which may be accessible anywhere and anytime, e.g. website, phone, or social media-based questionnaires to collect TB notification and medication data, remind patients to consume or refill their medications, or do online consultations or testing (Klinton et al., 2021; Rakhmawati et al., 2021; Roberts et al., 2021; Taswin et al., 2021; Zimmer et al., 2021). This offline-to-online switch may not be accessible to some lower-income households due to signal barriers or the inability to afford mobile phones (Mishal et al., 2021; Sobin et al., 2021).

How does The Role of Community Health Workers Fit in the Puzzle of Solving These Barriers?

WHO records that the rate of GDP per capita and prevalence of undernourishment is inversely and directly proportional to TB incidence, respectively. WHO states that multisectoral commitment and accountability are needed to address TB SDoHs, especially in the current context of the COVID-19 pandemic, coupled with the ongoing crisis (food insecurity, armed conflicts, and political and economic instability). Hence, WHO has designed a Multisectoral Accountability Framework to Accelerate Progress to End TB (MAF-TB), which countries have adopted since 2019. One of its strategies is through the engagement of communities and civil society organizations, which is included in one of the End TB Strategy Pillars and has proven to undergo increasing trends worldwide (WHO, 2023).

According to WHO European Region, since TB is a social disease in terms of its risk factors and determinants and requires months of treatment, a people or patient-centered approach is the appropriate way to address it. This means the management of TB needs to shift from a hospital-dominated model to one embedded within the communities and led by the primary care system, making it nearer and more accessible to patients. This type of care ensures that services meet patients' and families' needs and expectations and takes into consideration patients' journeys and social determinants of health. It also requires responsibilities to be clearly defined for each setting with well-functioning data-reporting and referral systems, which allow coordinated response to address the patient cases in an individualized approach (WHO EURO, 2017).

Community health workers (CHWs) are one of the actors of a people-centered model of TB. Their roles in each step of the healthcare model are (WHO EURO, 2017):

Prevention – deliver education on TB in a way easily understood by patients and their families. This may reduce the risk of infection transmission, cost of care, and stigma surrounding TB treatment.

Detection and diagnosis – active case finding means systematic screening of high-risk and vulnerable populations with limited or no access to health services (people who inject drugs, homeless people, people with HIV, migrants, refugees, etc.) or screening of new TB patients in home settings or primary care facilities.

Treatment – directly observed treatment (DOT) to remind patients to refill and consume their medications to improve adherence and avoid drug resistance.

Many low and middle-income countries (LMICs) have proven that CHWs can play a role

in providing patient-centered healthcare close to the community. This article explores examples recorded in Madagascar, Sub-Saharan Africa, India, Brazil, Pakistan, and Argentina. First, community health workers build a respectful and trusting relationship with TB patients, encouraging patients to be more open about their clinical progress, side effects, and medication adherence. This is important to reduce the number of drug-resistant TB patients and the mortality caused by TB. Second, CHW visits allow continued treatment despite geographical barriers. They can provide patients with medicines, food, mental health support, testing, and treatment delivery. This allows healthcare delivery to be more personalized and routine (Mishal et al., 2021; Formenti et al., 2022; Franke et al., 2022).

This is also the same case in Indonesia. CHWs have become an important mediator between HCPs and TB patients. CHWs conduct door-to-door visits to do health promotional activities with printed or electronic media (as a complementary to HCPs' educational activities at primary healthcare centers) and TB screening. CHWs also retrieve information about newly-diagnosed patients as they screen communities' houses or from HCPs who closely coordinate with village officials. CHWs will conduct contact investigation and tracing, collect patients' sputum specimens, and accompany patients to PHCs for further testing (Siti et al., 2021; Fridessia et al., 2022). CHWs also play a role in disease control. They will provide mental health support and education to patients' families on how to do DOT to ensure adherence, maintain home hygiene and healthy lifestyle to prevent TB complications, and reduce stigma towards TB patients (Ana et al., 2021; Andi et al., 2021; Fauziah et al., 2021; Windy et al., 2021; A. Awaliya et al., 2022; Herry et al., 2022; Salsha et al., 2022; Wiwiek et al., 2022; Hendra et al., 2023). They will report the patients' progress periodically to HCPs based at PHCs. CHWs also conduct advocacy activities to push agendas to national or local stakeholders (religious or cultural leaders) to establish policies that empower TB patients (Fauziah et al., 2021).

CHWs role is significant in strengthening community-based health service by increasing the sense of solidarity and cooperation to overcome TB as a community, raising awareness to spread accurate information about TB to society, and conducting TB prevention steps, including mainstreaming healthy lifestyles as the community's basic needs (Fauziah et al., 2021).

CHW Visits are Ideal, but Are There Any Challenges?

CHW visit is an ideal solution to TB determinants. However, challenges remain today, even exacerbated by the COVID-19 pandemic. First, some CHWs may struggle to manage their time and prioritize health delivery, as most CHWs have other responsibilities in their households or are involved in other community programs. Second, CHWs may lack motivation due to small financial incentives and a lack of facility support, such as training, transport, educational media, and mental health counseling. Reallocation of resources to COVID-19 response causes their jobs to exceed pre-determined responsibilities without enough supply of PPE, workforce, effective diagnostic tools, or data-sharing equipment. There is also a lack of HCP-official-CHW coordination in the healthcare system and patient cooperation due to high stigma in society, low health literacy, and switching to mobile phones without equal access to the internet, making them hard to contact and follow up (Friedessia et al., 2021; Mishal et al., 2021; Siti et al., 2021; Formenti et al., 2022; Franke et al., 2022; Wiwiek et al., 2022). At times, CHWs would make more personal sacrifices, even money, to support TB patients with food or medication (Franke et al., 2022).

COVID-19 physical restrictions have become a barrier to offline meetings for socialization and societal support. There is a decreasing number of patients who participate in such activities due to worry and fear of being infected by COVID-19, lowering CHWs' motivation to deliver healthcare services (Fauziah et al., 2021; Windy et al., 2021; Hendra et al., 2023).

What Actions Should Be Taken to Strengthen Community-Based Intervention?

Poverty, which leads to inappropriate housing and a non-hygiene lifestyle, has been the main cause of TB. In return, TB patients face barriers to accessing healthcare services, often receive negative stigma, lose their jobs and earnings, and are sent again into the poverty spiral (Sobin et al., 2021). That is why a multisectoral approach and bringing healthcare closer to them is needed to make communities resilient to improve their quality of life. Some recommendations proposed to strengthen community-based interventions are as follows.

Improve Health Financing Mechanisms for TB

Sufficient training and knowledge refreshment sessions for CHWs is the most mentioned recommendation observed in this research. Routine training on knowledge about TB, communication, organizational, and technology skills should be provided for CHWs to ensure that they know how to approach patients in a non-judgmental and humanizing way and utilize facilities for more efficient healthcare delivery (Ana et al., 2021; Andi et al., 2021; Siti et al., 2021; Windy et al., 2021; Franke et al., 2022). CHWs may learn not only about TB but also infectious diseases with specialists or pulmonologists to allow a broader, integrated, and people-oriented understanding of TB. Learning systems should also shift from compulsory refresher courses to a more flexible model of continuous professional development, whose courses can be taken anytime by CHWs and are associated with the number of credits collected, hence renewal of their certification and licensing within a specific period (e.g., five years). There should be an accreditation formed to define the indicators of CHWs' competencies, as well as an evaluation system to reassess their performance and workloads—if they suit the latest developments in medicines and technologies (WHO EURO, 2017). Healthcare systems should also provide easily available mental health counseling and appropriate financial incentives to increase motivation for CHWs experiencing increased workload or stress (Mishal et al., 2021).

Mainstreaming Health-in-All Policies (Multisectoral Partnership)

According to WHO, to address TB determinants, a "Health in All-Policies (HiAP)" approach should be used. HiAP recognizes that population health and inequities in health are not merely products of health sector programs but also policies beyond the health sector (WHO, 2023). HiAP to address TB may include: designing strategies that reduce poverty and increase social protection; reducing food insecurity; improving living and working conditions (including for prisoners and migrants); and promoting healthy diets and lifestyles, including reduction of smoking, harmful use of alcohol and drugs (WHO, 2023). To do this, WHO advocates for political commitment at all levels and a multisectoral collaboration system through the MAF-TB framework. At the global level, WHO has collaborated with various UN agencies, for example, the International Labour Organization (ILO), International Organization for Migration (IOM), World Food Programme (WFP), UN Children's Fund (UNICEF), Global Fund to Fight AIDS, Tuberculosis and Malaria (the Global Fund), Stop TB Partnership and CSTF (WHO's Civil Society Task Force on TB), and other civil society and community organizations. WHO has also compiled practical guidelines and best practice case studies from six WHO regions to encourage policy-makers beyond and within health sectors to implement strategies that end TB (WHO, 2023). Some examples in several highlighted countries may include the following:

1. **Armenia** established a multisectoral working group consisting of the National Centre for Pulmonology (NCP), the National Centre for AIDS Prevention, civil society and TB-affected community organizations, TB research centers, and the Global Fund Project Implementation Unit. This working group coordinates with national ministries and WHO Regional Office through policy dialogues and consultation sessions to ensure transparency and inclusivity.

2. **Brazil** involved a task force of civil society organizations in monitoring their implementation of the National Tuberculosis Strategy (NTP).

3. **China** formed a multidepartmental working mechanism under the leadership of the state council, consisting of multiple ministries, led by the National Health Department as commander-in-chief, which focuses on preventing and controlling TB as a part of the Healthy China Action Plan implementation.

4. **India** developed a national multisectoral action framework consisting of a list of governmental stakeholders involved and the scope of work of each stakeholder, as well as resources for defined strategic areas (e.g., financing, capacity building, technical resources, and research).

5. **Pakistan** developed a pilot project at the district level involving education, social and population welfare, prisons, religious affairs, labor, mass communication, and private sectors for case detection. It also endorses TB elimination and MAF-TB in local workshops.

6. **South Africa** developed the national MAF-TB based on the survey and interview conducted by the MAF-TB reference group, consisting of multisectoral stakeholders—the Department of Health, the Civil Society Forum, people living with HIV, and the Private Sector Forum. The national MAF-TB includes a roadmap of TB response and is accompanied by the formation of a new TB technical working group (TWG).

MAF-TB continues to be endorsed by the WHO at high-level events and forums. As knowledge sharing is imperative to be done among CHWs and policy-makers, the WHO also facilitates experience sharing and discussion among member states on the End-TB Forum website (WHO, 2023). With a concerted multilateral effort, CHWs may receive more comprehensive support to strengthen community-based interventions.

Disclaimer

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