Beyond the treatment episode: Closing gaps across the continuum of care

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Tuberculosis (TB) remains endemic disease in tropical countries, such as in Malaysia. According to the global report on Tuberculosis 2025 by the World health Organisation (WHO), estimated TB incidence per 100,000 population was 99.6% in the year 2010, with slight reduction in the incident rate of 96% in 2024. In term of number of deaths, it was estimated of 2569 deaths due to TB in 2010 (9.1 deaths per 100,000 population, 28 million population) with reduction in death per population in 2024 with 2963 deaths (8.7 deaths per 100,000 population of 34.1 million population).[1] Ho et al.[2] who studied the mortality rate among TB patients in Lubok Antu Health Clinic, in a rural area of Sarawak state in Malaysia in 2020, and found that patients compliant with treatment were more likely to survive with odd ratio, OR of 12.5 (95% CI: 1.61, 97.34), p=0.028.[2]

There were also high estimated percentage of TB patients who had multidrug resistant among previously treated pulmonary TB cases when compared with new Pulmonary TB cases. The level of multidrug resistant was 7.3% and 1.5% in 2015 compared with 11.7% and 0.8% in 2024.[1] The increasing trend of multidrug resistant cases among previously treated patients should be our concern. Sidek MY, et al (3) reported that 66.7% drug-resistant TB patients in the cohort of his study received supervised treatment from healthcare providers, with 37.4% had more than one anti-TB resistance. Favourable treatment outcomes were observed in 56.7% of cases, while 42.1% had unfavourable outcomes, mainly due to loss to follow-up (49.7%), death (42.6%) and treatment failure (7.7%).[3] The estimate funding for TB prevention, diagnostic and treatment in Malaysia was USD 15.6 million in 2020 with just slight increment with USD 17.6 million in 2024 (12.8%).[1] This infectious disease is also predominately affecting those living in a crowded living condition, and poor health conditions due to poverty.

In this issue, Ganesan et al (4) found the adherent rate to TB treatment was only 84%.[4] He found that stigma, knowledge on TB, direct observed treatment short course modality and clinic waiting time were the independent association with poor treatment adherence. Another study published in this issue by Jastin et al (5) found that failure to perform screening among TB contacts was the main issue in the eradication and control of the disease, in locality of high-burden of such as in Kudat district, Sabah state of Malaysia.[5] The authors found that factors associated with a lower odd of non-attendance were contacts of male TB index patients, contacts of extrapulmonary TB index patients and higher altitude scores.

A third paper published in this issue is a systematic review of TB recurrence in Asia by Isa. The author found that recurrence was highest within the first two years after treatment and was associated with clinical, behavioural, socioeconomic and environmental determinants.[6]

In a way, these three papers highlight the critical points representing the vulnerabilities where patients can be "lost" across the continuum of care: (1) non-attendance at initial contact screening[5], (2) adherence during treatment[4], and (3) recurrence even after treatment completion.[6] One should remember that healthcare is often rendered in discrete episodic manner, e.g., a screening appointment, a diagnosis, a course of treatment, a discharge. But from the patient's perspective, illness is experienced as a continuous journey with vulnerable transitions along the way. Hence, as hard as it may be, these episodes of care must be monitored and integrated into a coherent whole; failure of which, care risks becoming fragmented across its various stages. At each transition, some never enter the designated clinical pathway, some disengage, and some return with recurrence, with complications or with unresolved morbidity even after apparent completion.

In this regard, a helpful framework that may be adapted is the Haddon matrix. Originally developed for injury prevention, this matrix examines factors operating before, during and after an event across the broad categories of "host", "agent" and "environment".[7] In the context of TB, the "host" represents the TB patient, the "agent" represents the pathogen or the disease progression and the "environment" represents the physical environment, as well as the social support and health-system environment that the patient is in. Horizontally, the "pre-event" phase concerns the entry, i.e., recognition of risk, contact tracing, screening and linkage to care. The "event" phase concerns engagement: diagnosis, treatment initiation, adherence and completion. The "post-event" phase concerns endurance: surveillance, recurrence, residual morbidity and re-entry into care. The matrix then asks two questions: When did the continuity of care break, and where are their contributing factors?

Having this kind of big picture mapped out in a matrix is believed to be important because we often tend to gravitate our explanations toward patient column. Yes, poor knowledge, weak motivation or individual non-compliance matters, but so are the infrastructure support, family support,

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clinic organisation and destigmatization. The matrix restores causation to context.

In conclusion, closing the gaps across the continuum of care requires more than improving the acute treatment for those already under our follow-up. It requires us as healthcare providers to reach out to those who have not yet entered the care journey, retaining those at risk of disengagement and remain attentive even after treatment formally ends. After all, our measure of success should not be myopic. It should not be just when the patient has completed the treatment that we render to them but to journey alongside with the patient across the continuum of care.

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