OPTIMISING THE 'FIRST MILE': A COMPARATIVE PROCESS-MAPPING ANALYSIS FOR CONTINUOUS VS. PULSE-SCREENING HCV MODELS IN MALAYSIAN PRISONS

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Background
Hepatitis C (HCV) elimination in prison requires optimised health system architectures. We evaluated two prison-based approaches: a Continuous model, based on screening at entry and a Pulse model which uses high-intensity mass-screening and process care in batches. This study aims to identify bottlenecks and estimate diagnostic capture efficiency in these two models.

Methods
We compared two prison-based models in Northern Malaysia using process mapping. The Continuous model involved opt-out screening at entry following a queueing structure; screening occurs continuously upon admission, but confirmatory testing is intermittent, occurring 2-3 times per month at the in-prison clinic via hospital-outreach. The Pulse model utilised a 4-day mass-screening campaign led by Primary Care teams and non-governmental organisations. This follows a batch-cyclical model where the entire care cascade is delivered in scheduled waves. Each cycle is timed so that the SVR12 testing of the previous batch coincides with the mass screening of the next new cohort. Data were analysed using process-flow charting to calculate median time-to-event (TTE) and stage-specific capture rates.

Results
Process mapping identified a confirmatory testing gap in the Continuous Model. Of 18,881 inmates screened (21.5% anti-HCV positive), only 793 (19.6%) underwent confirmatory testing due to limited clinic frequency. Conversely, the Pulse Model eliminated this queueing bottleneck through a mass-capture approach, achieving an 80.6% (108/134) diagnostic rate with a Median 1-day TTE for RNA sampling. However, the resulting surge of diagnosed patients created a downstream initiation delay (Median 101 days vs. 40 days in the Continuous model).

Conclusion
Pulse models are superior for maximising diagnostic reach in resource-limited settings by bypassing daily queueing bottlenecks. However, batch-cyclical success requires a synchronised clinical response. Prison systems should adopt a hybrid architecture: utilising high-intensity primary care 'pulses' for mass screening, paired with dedicated 'initiation squads' to prevent downstream congestion and manage the treatment surge.

Disclosure of Interest Statement
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