

99DOTS: Monitoring and Improving TB Medication Adherence Using Mobile Phones and Augmented Packaging

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Background and challenges to implementation: A critical challenge in tuberculosis treatment is to ensure that patients adhere to the full course of medication. In India, use of Directly Observed Therapy (DOT) in the public sector has been associated with high treatment success. However, direct observation introduces challenges for patients and providers, who need to undertake frequent travel throughout the course of treatment. It is also challenging for program managers to detect and respond to missed doses in an accurate and timely way.

Intervention or response: A low-cost approach for monitoring and improving TB medication adherence, called 99DOTS, was deployed in a public-sector program in Samastipur district, Bihar, India. Each anti-TB blister pack is wrapped in a custom envelope (pictured), which includes a hidden phone number that is visible only when a dose is dispensed. After taking the medication, patients make a free call to hidden phone number, yielding high confidence that the dose was “in-hand” and has been taken. Initially, patients undergo normal DOTS supervision and providers assist in making the call. Over time, adherent patients can take custody of their drugs and make calls with lesser supervision, while still permitting remote monitoring of each dose. In addition to compiling a real-time dosing history for each patient, 99DOTS enables a wide range of reminders, alerts and follow-ups.

Results and lessons learnt: From August, 2014 to January, 2015, 49 patients initiated treatment under 99DOTS. Of these, 31 showed 100% adherence, 16 patients showed 85-99% adherence and 2 patients showed 75-85% adherence. A total of 1791 doses were logged via calls to 99DOTS. Most doses were observed by providers; however, small-scale experience with self-administration (5 patients) and family observation (6 patients) showed adherence of 94% and 91%, respectively.

Conclusions and key recommendations: 99DOTS empowers patients, providers, and treatment programs, supporting health system efficacy and efficiency. Adherent patients can take independent custody of their drugs and confirm consumption without physical observation, which simultaneously reduces the burden on providers. Program managers gain real-time information on adherence, enabling more customized and more efficient patient supervision and support. 99DOTS may be especially applicable as India switches from thrice-weekly to daily regimens, as it enables daily monitoring without daily observation.

