Educate, Test and Treat Model towards elimination of hepatitis C infection in Egypt: Implementation and results in 100 Villages

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Background: Egypt has a very high prevalence and burden of HCV infection in the general population and associated liver related morbidity. We report implementation and scale-up of a comprehensive community-based HCV prevention, testing and treatment model from one village in 2016 with the goal to eliminate HCV infection from all adult villagers to 100 villages in seven governorates across Egypt. Our primary objective was to establish feasibility and effectiveness of this model at scale on key outcomes (uptake of serological HCV and HBV testing, linkage to assessment and HCV viral load confirmation, uptake of treatment, and cure) and to derive lessons learnt to inform further implementation as a model for elimination of hepatitis C infection in rural communities.

Methods: A demonstration project was first established from 06/2015 to 06/2016 in Al-Othmanya village that was then extended during 2016 to 2018 to 100 villages in 7 governorates in Egypt. The model comprised **community mobilization** facilitated by a network of village promoters to support an education and test and treat campaign with fund raising in the local community; **a comprehensive testing, linkage to care and treatment of all eligible villagers aged 12 to 80 years** using HCV antibody and HBsAg rapid diagnostic tests (RDTs) with HCV RNA confirmation of positive cases and staging of liver disease using transient elastography (FibroScan); and **an education campaign** to raise awareness and disseminate messages about safer practices to reduce transmission through public events, promotional materials and house-to-house visits. All those HCV RNA positive received a 12 or 24 week treatment with a direct acting antivirals (DAA) regimen according to national standard of HCV care at the time of diagnosis with an assessment of cure at 12 weeks after completion of treatment (SVR12). Key outcomes assessed in each village were: uptake of serological HCV and HBV testing, linkage to assessment and HCV viral load confirmation, uptake of treatment, and SVR12.

Evaluation of the impact of the educational campaign is ongoing across all villages to evaluate incidence of new HCV and HBV infections among those HCV antibody negative during the original screening programme.

Findings: 276176 (92.9%, 95% CI 92.1-93.7) of 297280 eligible villagers were screened for HCV antibody and HBsAg, and 50002 (18.1%, 95% CI 13.3-17.0) and 946 (0.34%, 95% CI 0.29-0.44) were positive, respectively. All 50002 HCV antibody positive individuals had an HCV RNA assay and 24045 (48.1%, 95% CI 45.0-51.5) were positive. 22252 (92.5%, 95% CI 91.4-96.4) received treatment within a median of 2.1 weeks from serological diagnosis (IQR: 0 to 3.3 weeks), with referral of other 1793 (7.5%) eligible persons to government treatment programme. Virological cure (i.e. SVR12) was achieved among 21839 of the treated cases (98.2%, 95% CI 97.2-98.6). 4833 cases had cirrhosis (20.1%) on FibroScan, and of these 219 (4.5% of those with cirrhosis) were diagnosed with HCC using AFP measurement, ultrasound and CT.

Interpretation: This community-led programme achieved high uptake of HCV testing, linkage to care and treatment, and attainment of cure across 100 villages in seven governorates in Egypt. We estimate treatment coverage and cure of >90% of the estimated infected population aged 12-80 years across the 100 villages. This confirms both the feasibility and effectiveness of this model to achieve elimination across a wide range of rural settings, and represents an important strategy to complement the national government programme towards elimination of HCV in Egypt.