

Technical appendices

Appendix 1: Empirical models

We used the following empirical model to analyze the effects of the pilot programme on multiple study outcomes at the level of township:

$$Y_{it} = \alpha_t + \eta_i + v_t + \delta \times \text{Treatment}_i \times \text{After}_t + \beta X_{it} + \varepsilon_{it} \quad (1)$$

Function (1) is a model of DiD analysis involving multiple periods (in this case 12 quarters over four years). α_t is a constant variable, η_i represents the fixed effects of each township, and v_t represents the fixed effects of each time period (t representing the number of quarters since the start of the data period). The existence of v_t also adjusts for seasonal effects. Treatment_i is a dummy variable, which takes the value of 1 if the township (i) was in the treatment group (among the gatekeeping pilot areas), 0 if not. After_t is a dummy variable taking a value of 1 if the time period (t) was after the start of the pilot and 0 if before. Standard deviation clustered at township level

The coefficient of the interaction term $\text{Treatment}_i \times \text{After}_t$, i.e. δ , captures the effects of the pilot policy. ε_{it} is a random error term with zero mean. The main effects of Treatment_i are omitted due to their perfect collinearity with η_i , while the main effects of After_t are omitted due to their perfect collinearity with v_t . In function (1) the covariates—available time-variant variables of township with possible effects on the outcome variables (X_{it}) are included (i.e. average age, and proportion of female enrollees). In addition, a simple DiD model (i.e. not including v_t or βX_{it}) and an unadjusted model (i.e. not including βX_{it}) based on function (1) were used to estimate the effects.

For the pre-trend test, the following equation was used with data from before the pilot:

$$Y_{it} = \alpha_4 + \eta_i + \beta \times T + \varrho \times \text{Treatment}_i \times T + \varepsilon_{it} \quad (2)$$

In function (2), β is the pre-pilot trend of the townships in the control group, while ϱ captures the difference in the pre-pilot trend between treatment and control groups. T is a linear time variable

taking the value from 1 to 12 for each quarter from the first quarter of 2012 to the last of 2014.

Appendix 2: Results of pre-trend test

Regression results of the pre-trend test are shown in Annex Tables 1 and 2. There were no significant differences between pilot and non-pilot townships in their trends of ambulatory visits at primary care facilities or hospitals. Similarly, the pre-trend test did not identify any significant differences between the trends of ambulatory care expenditure. Overall, the results in general strengthened the confidence in results of the difference-in-differences analysis.

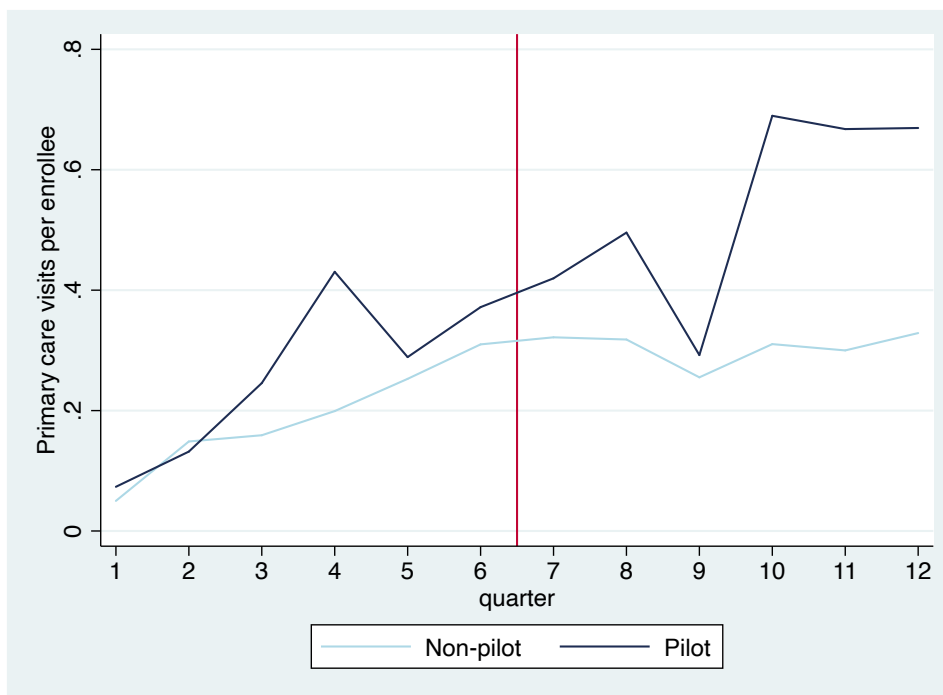
Appendix table 1. Pre-trend test of ambulatory visits per enrollee per quarter by level of care between pilot and not pilot townships (N=102)

Facility type	Coefficients	[95% CI]		P-value
Primary care facilities	0.010	-0.013	0.034	0.363
Hospitals	0.004	-0.015	0.023	0.654
District hospitals	0.004	-0.013	0.022	0.595
Tertiary hospitals	0.000	-0.002	0.001	0.663

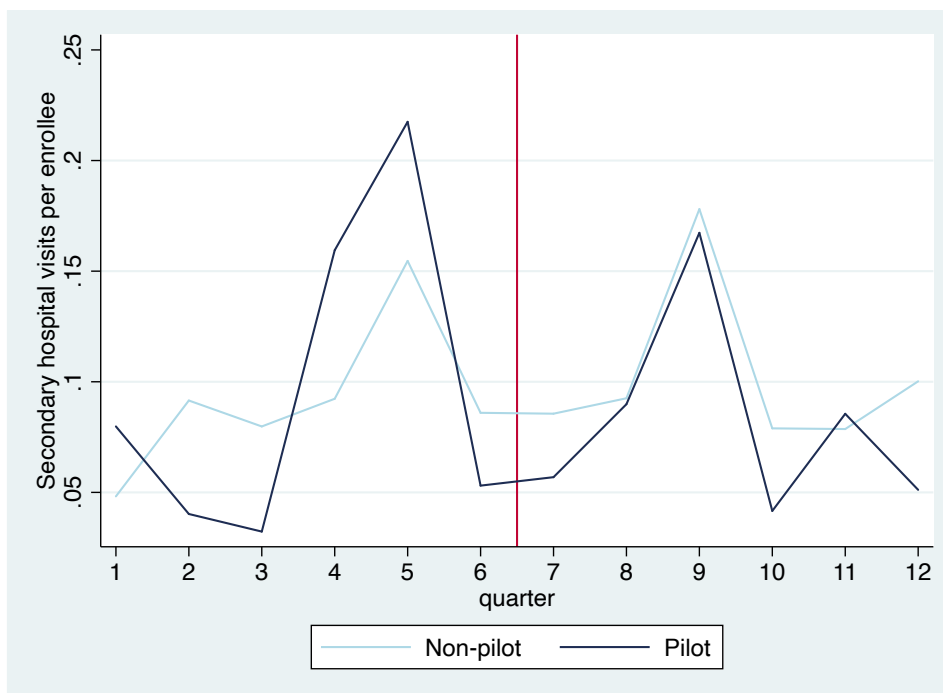
Appendix table 2. Pre-trend test of ambulatory care expenditure per enrollee per quarter by level of care between pilot and not pilot townships (N=102)

Facility type	Coefficients	[95% CI]		P-value
Primary care facilities	0.479	-6.696	7.654	0.889
Hospitals	10.405	-12.613	33.423	0.352
District hospitals	8.089	-5.126	21.304	0.213
Tertiary hospitals	2.316	-7.598	12.231	0.627

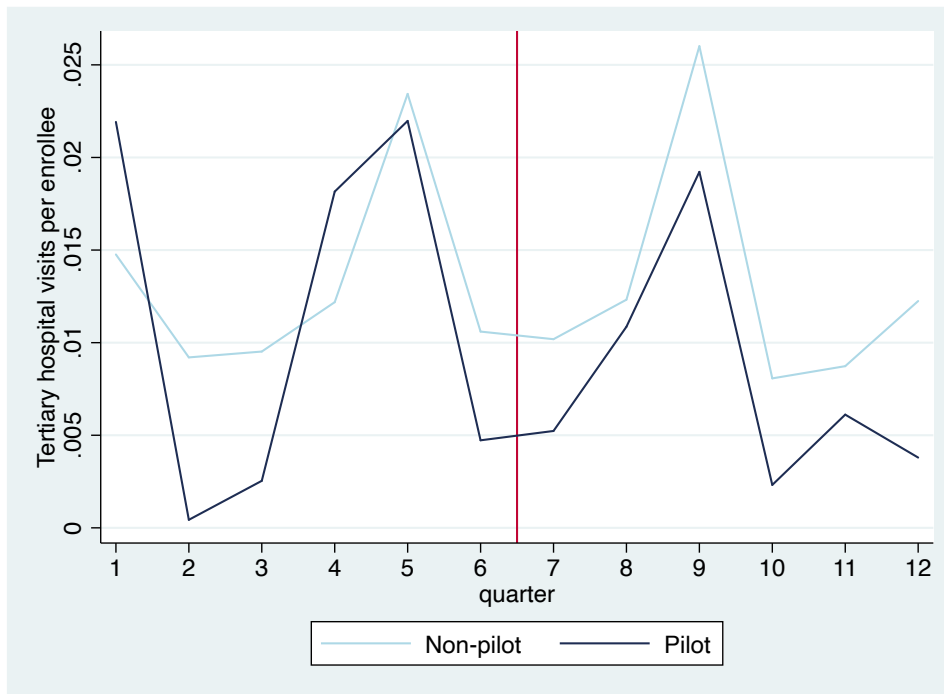
Appendix 3. Trendline figures of key outcome variables in non-pilot and pilot townships



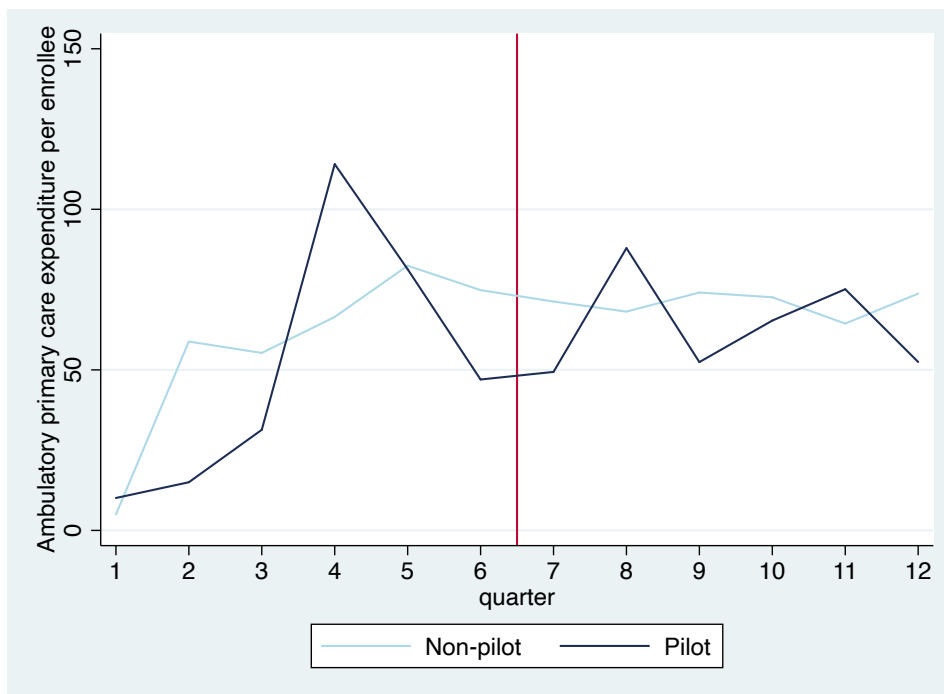
Appendix figure 1. Primary care visits per enrollee per quarter



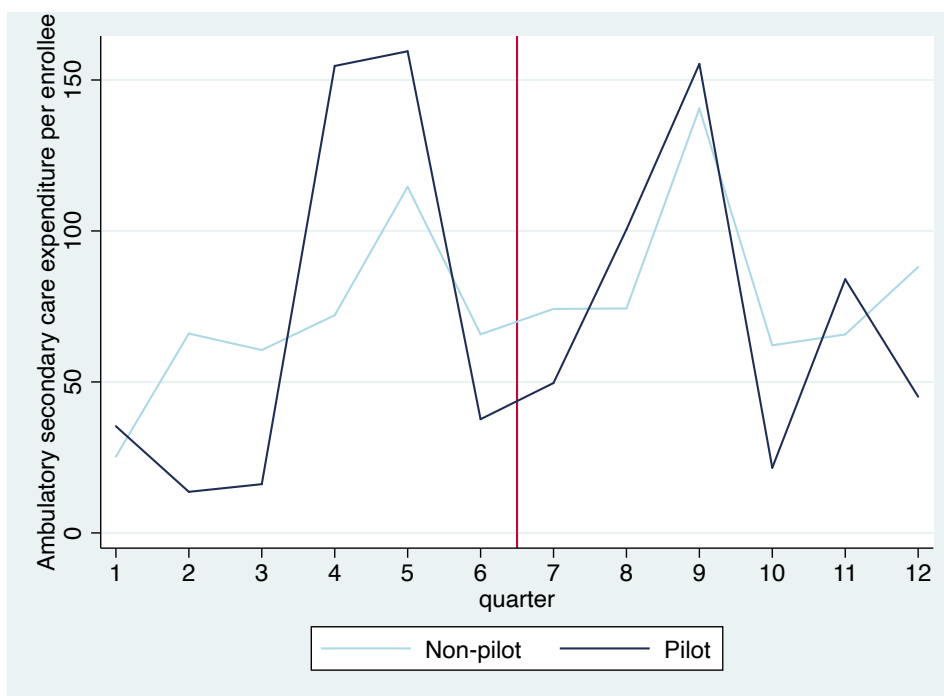
Appendix figure 2. Secondary hospital visits per enrollee per quarter



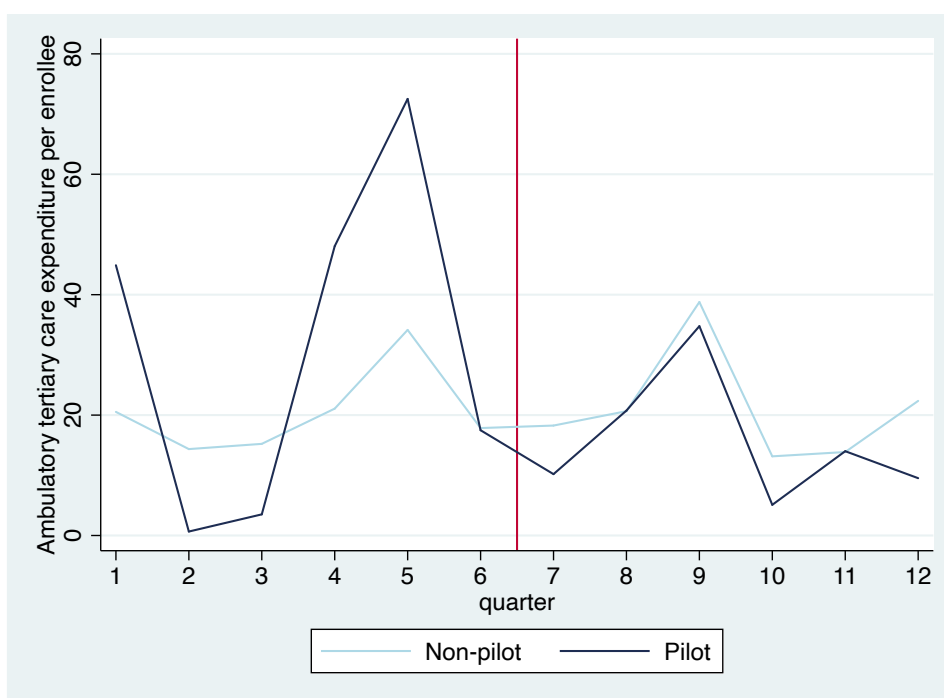
Appendix figure 3. Tertiary hospital visits per enrollee per quarter



Appendix figure 4. Ambulatory primary care expenditure per enrollee per quarter



Appendix figure 5. Ambulatory secondary care expenditure per enrollee per quarter



Appendix figure 6. Ambulatory tertiary care expenditure per enrollee per quarter