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Case Study 5
Integration of Expanded Programme on Immunisation and Family Planning Clinics: Value for Money Study

Kalikot Operational Research Pilot 2012-13

Rachel Phillipson

Strengthening Health Systems-Improving Services

LIST OF ACRONYMS

CHD	Child Health Division
CPR	Contraceptive Prevalence Rate
CYP	Couple Year Protected
DALY	Disability-adjusted Life Year
DHS	Demographic and Health Survey
EPI	Expanded Program on Immunisz~~z~~ation
FHD	Family Health Division
FP	Family Planning
GDP	Gross Domestic Product
GoN	Government of Nepal
HERD	Health Research and Social Development Forum
MDG	Millennium Development Goal
MSI	Marie Stopes International
PAA	Population Association of America
UNFPA	United Nations Population Fund
VfM	Value for Money
WHO	World Health Organization

1 DESCRIPTION OF PROGRAMME TO BE ASSESSED

The Government of Nepal (GoN)'s Family Health Division (FHD) and Child Health Division (CHD) are piloting the integration of Family Planning (FP) services into child vaccination (Expanded Program on Immunisz~~z~~ation (EPI)) clinics in Kalikot, a mountain district in the Mid-western region of Nepal. The aim of the pilot is to investigate the feasibility of reducing the unmet need for modern contraception among women who have had a child in the last two years by offering FP advice and free commodities when they visit vaccination clinics with their baby.

This Value for Money (VfM) assessment aims to evaluate the costs and evidence of effectiveness from the pilot exercise. A broader evaluation, looking at implementation issues and challenges for a nationwide scale-up, is being undertaken separately.

2 BACKGROUND TO EPI CLINIC AND FP INTEGRATION IN NEPAL

The World Health Organization (WHO) recommends an interval of at least two years between live births in order to reduce the risk of adverse maternal and child health outcomes.[1] Increased birth spacing is also an important factor in reducing the number of children in high-fertility populations. Internationally, only 3% of postpartum women want a new baby within two years, yet only 40% actually use a FP method for birth spacing.[2] In Nepal,[3] 20% of births still occur within two years of a previous birth,[4] while only 9% of women who have had a live birth in the past five years recall being counseled on FP during postpartum check-up. This indicates both the need and the missed opportunities to provide FP advice and services to new mothers.[5]

Kalikot is a mountain district in the Mid-western region of Nepal; its total population is 140,000, with a population growth rate of 2.94% (2011), more than double the national average of 1.35%[6]. The Contraceptive Prevalence Rate (CPR) in the Mid-western region amongst all married women is somewhat lower than the national average (40% compared to 43% nationally);[7] amongst postpartum women specifically (defined here as those with a child under one year of age), the CPR is 14.8% in the Mid-western mountain region, compared to 22.6% nationally. Thirty-two percent of married women[8] in the region have an unmet need for FP, compared to 27% nationally. Almost one-quarter of women in the region of childbearing age (15-49 years old) have not been exposed to FP messages.[9] Key fertility indicators in Nepal and the Mid-western region are summarized in Table 1 below.

Birth spacing is the result of a combination of postpartum amenorrhea and abstinence (together termed

[1] Marston, C., 2006. *Report of a WHO Technical Consultation on Birth Spacing. Geneva, Switzerland 13-15 June 2005*. Geneva: World Health Organization. Available through: WHO website <http://www.who.int/maternal_child_adolescent/documents/birth_spacing.pdf> [Accessed 9 August 2013]
[2] Ross, J.A. and Winfrey, W.L., 2001. Contraceptive Use, Intention to Use and Unmet Need During the Extended Postpartum Period. *International Family Planning Perspectives,* March, 27(1), pp.20-27. Available through: Guttmacher Institute website <http://www.guttmacher.org/pubs/journals/2702001.html> [Accessed 9 August 2013]
[3] Population Division, Ministry of Health and Population, Government of Nepal, New ERA, and ICF International, 2012. *Nepal Demographic and Health Survey 2011*. Kathmandu: Nepal. Ch.5.2, p.76. Available through: MEASURE DHS website <http://www.measuredhs.com/pubs/pdf/FR257/FR257%5B13April2012%5D.pdf> [Accessed 9 August 2013]
[4] Population Division et al., 2012. Ch.5, p.75.
[5] Health Research and Social Development Forum, 2013. *Process Evaluation & Monitoring Report Kalikot District (Mid-July 2012 to Mid-April 2013).* Kathmandu: Nepal. Introduction, p7.
[6] Central Bureau of Statistics, Government of Nepal, 2011. *Final Result of Population and Housing Census 2011 Major Highlights.* Kathmandu, Nepal. Available through: GoN National Planning Commission Secretariat Central Bureau of Statistics website <http://cbs.gov.np/wp-content/uploads/2012/11/Major-Finding.pdf> [Accessed 9 August 2013]
[7] Population Division et al., 2012. Table 7.3, p.96.
[8] Population Division et al., 2012. Table 7.12, p.104.
[9] Population Division et al., 2012. Table 7.14, p.106.

'postpartum insusceptibility'), plus the use of contraception. It is therefore influenced by physiological factors, cultural practices, and couples' FP choices. The median[10] interval between live births in Nepal is 36.2 months,[11,12] but it varies significantly. Postpartum insusceptibility is substantially longer among women age 30-49, rural residents, and those in the mountain zone. Women in the Mid-western region have the longest postpartum insusceptibility. Women with no education have a longer duration of postpartum insusceptibility than women with higher levels of education (10.7 months versus 5.7 months). Women in the lowest wealth quintile are insusceptible almost three times longer than women in the highest (12.1 months versus 4.7 months).[13] The median birth interval is almost 11 months shorter between births where the previous sibling has died.[14]

Table 1: Fertility in Nepal: National and Mid-western Region Indicators, 2011[15]

Fertility Indicator	Mid-western Region	National Average
Total Fertility Rate	3.2	2.6
Percentage of women (15-49 years) currently pregnant (%)	6.5	4.9
Mean number of children ever born to women aged 15-49 years	5.0	4.3
Median number of months since preceding birth	35.6	36.2
CPR (any modern method, % of married women)	40.4	43.2
CPR (any modern method, % of women with children under one year of age)[16]	14.8	22.6
Unmet need for contraception (% of married women)	32.0	27
Births delivered in a health facility (%)	29.1	35.3
Children 12-23 months fully immunised (%, basic vaccinations)	84.7	87.0

3 CASE STUDY METHODOLOGY

The EPI/FP integration pilot started in July 2012 and covers the entire district, being taken forward in all functioning EPI clinics of the 30 health facilities in Kalikot. Data for this VfM assessment are taken from the June 2013 Health Research and Social Development Forum (HERD) final report,[17] which covers nine

[10] Data collected by DHSs show that the distribution of breastfeeding duration is highly skewed, with a few individuals breastfeeding for considerably longer than the average. In this case, the median duration is probably a better measure than the mean. In general, the median duration is one-and-a-half to two months shorter than the mean, although in some countries it can be as much as five months shorter.
[11] An increase from 31.8 months in 2001.
[12] Population Division et al., 2012. Ch.5.5, p.79.
[13] Population Division et al., 2012. Ch.5.5, p.81.
[14] The median birth interval is almost 11 months shorter among births *where the previous sibling is dead* than among births where the previous sibling is alive (26.2 months and 36.9 months, respectively). This difference in birth intervals may be the result of parents' desire to replace a dead child as well as the loss of the fertility-delaying effects of breastfeeding. Population Division et al., 2012. Ch.5.5, p.79.
[15] Population Division et al., 2012.
[16] Population Division et al., 2012. Mid-Western region estimate of 14.8% is specifically for Mid-western *mountain* region. (S. Mehata NHSSP).
[17] Health Research and Social Development Forum, 2013.

months[18] of implementation, up to April 2013. These data were annualised by being factored up by 25%. Over the reporting period, service data were collected from 27 of the 30 health facilities and 117 of the 143 (82%) EPI clinics. In addition, interviews were conducted with service providers and service users.

We did not attempt any modeling of *substitution* (existing FP users switching the source of their contraception to the EPI/FP clinic rather than being entirely new users). Instead we did a simple sensitivity analysis using different proportions of new users (see below in the Results section). Nor did we take account of possible *redundancy* (new users adopting FP while still in postpartum insusceptibility): we assume the counseling given to individual mothers at the clinics screened out all those within six months of having given birth and therefore not yet in need of contraception.[19] Finally, we have not attempted to quantify the social value of increased participation of ethnic minority groups.

4 COSTS

For the VfM assessment it is necessary to isolate the *recurrent* costs from the *research* costs; the latter are the one-off costs of managing and implementing the pilot and analysing the results, which are not relevant to understanding the cost-effectiveness of a national programme. Furthermore, we have identified only the *incremental* recurrent costs – i.e. only those that would be additional to the cost of running the EPI clinics in their current (unintegrated) form. These were:

- Training of three health workers per facility (90 people in total) plus orientation for each facility's management committee (£7,622);
- Production and distribution of FP education materials (£1,800);
- 'Motivational'/publicity materials (£900).

No special budget for the pilot was created by the Ministry of Health and Population. The incremental costs listed above have been met by the Nepal Health Sector Support Programme (NHSSP) for the period of the pilot. The cost of additional FP commodities has not been included since we were informed that they were supplied[20] from existing stocks held at the health facility and carried to the EPI/FP clinic by the health workers at no extra cost. We have costed these commodities according to United Nations Population Fund (UNFPA) 2012 Contraceptive Price Indicators, in the proportions found in the pilot[21] and show them separately. A full Couple Year Protected (CYP) cost is used in each case.

Additional transport expenses and per diems (to ensure a second health worker attends every EPI/FP clinic to support the new FP activities) were also not necessary for the pilot, since the standing health worker field allowance is intended to cover this.[22]

The pilot found that 'the EPI/FP integration has not affected the routine utilisation of immunisation

[18] For the VfM analysis, the findings were annualised by being factored up by 25%.
[19] There is some evidence that redundancy can be significant: e.g, see Rossier, C. and Hellen J., 2013. Family Planning during the Postpartum Period in Ouagadougou, Burkina Faso: A Qualitative Supply and Demand Perspective. In: Population Association of America (PAA). *PAA Annual Meeting*. New Orleans, 11-13 April 2013. Silver Spring: PAA. Available through: PAA website <http://paa2013.princeton.edu/papers/131993> [Accessed 9 August 2013]
[20] Condoms, oral contraceptive pills, and injectables were provided at the EPI/FP clinics. Condoms and pills were provided on a one-off basis; only injectables (Depo-Provera) were available on a repeat basis.
[21] 'Of the total FP device users 64.7% used Depo-Provera, 27.7% used Condoms and 7.6% used Oral Contraceptive Pills' Health Research and Social Development Forum, 2013. p.16.
[22] Ensuring sufficient health workers attend the integrated clinic is therefore a management, rather than a financial, issue.

services'.[23] It is therefore assumed that no social costs through an adverse impact on child vaccinations have been incurred.

No estimate has been made for the additional cost to the health facilities of an increase in the rate of referral of potentially pregnant women arising from the integrated clinics; nor for the reduced cost to the wider health system in the longer term of dealing with fewer pregnancy complications as a result of a higher CPR/lower birth rate.

5 RESULTS

It is reported that, over the first nine months of the pilot, 867 people out of a total of 2,349[24] (37%) attending an EPI/FP clinic in Kalikot received FP devices from the EPI/FP clinics, of which 572 (66%) were new users. This implies, of all the clients at the EPI clinics, about one-quarter (37% x 66% = 24%) were new users of FP.

This proportion of new FP users may be over-reported, partly because it is not clear that the definition of 'new' is consistent. Modern contraceptive prevalence among postpartum women in the mid-Western region is 15%, so it is to be expected that a similar proportion of existing users would be found in the pilot. It is possible either that repeat visitors over the nine months have been recorded as new each time, or that some have interpreted 'new' as meaning new to FP *at the EPI clinic*. Since the pilot method did not take explicit measures to check, it is reasonable to assume that some undetected degree of switching between sources (either from the health facility or from a private sector pharmacy) is taking place.

The possibility of switching occurring is also suggested by the separate interview survey of clients of the EPI/FP clinic, which found that 32% of 100 women interviewed were using FP, 18% having taken them from the EPI/FP clinic. We therefore use 18-24% as the range for the estimate of new users during the pilot.

The pilot found that the vast majority (93.5%) of the women agreed that "the EPI clinic is a convenient location… to get FP devices". This finding was not further explored, but the notion of convenience implies an element of saving time. It is therefore assumed that women who were already FP users but who took FP commodities from the EPI clinic would otherwise have collected their commodities from the health facility. There is some monetary value to this 'convenience' but it is likely to be small in relation to overall costs, so it has not been estimated. More importantly, greater convenience may improve the continuity of FP use among these mothers. It has not been possible to estimate the size of this effect but it is captured to some extent in the alternative estimate for postpartum users in Table 2 below.

[23] Health Research and Social Development Forum, 2013. Executive summary, p.20.
[24] In 27 out of 30 health facilities. See: Health Research and Social Development Forum, 2013. Table 3.

6 VFM ASSESSMENT

6.1 VFM OF THE PILOT OVER ONE YEAR

6.1.1 Economy

Economy refers to the price at which inputs (human resources, drugs, and supplies) are procured. We see no change in these over the time period assumed for the VfM assessment.

6.1.2 *Efficiency*

At the upper limit of our estimate of 24% of EPI clinic users (286 people, on an annualised basis) taking up FP for the first time, the incremental cost (excluding FP commodity costs of £3.53/year) per new FP user per year is £36.00/$55.00.

With the level of pilot delivery costs unchanged but the number of new FP users reduced to the lower limit of our estimate of 18% (i.e. 215 new users on an annualised basis), the incremental cost of the EPI/FP clinic (excluding FP commodity costs of £3.53/year) per new FP user per year is £48.00/$73.00.

We have two benchmarks against which to assess this result:

1) The Guttmacher Institute/UNFPA[25] estimate the average direct cost (excluding any capital investment or FP commodities) of reducing unmet need for contraception in all developing countries as about $2 per new user.

2) A recent analysis of different approaches to reducing child mortality and improving maternal health in Nepal,[26] including in high-cost mountain districts, estimates that a package of interventions that would (amongst other things) reduce unmet need for FP of the order that the pilot is achieving would cost (including annual incremental recurrent costs, drugs and supplies) $4.20 per capita.[27]

Neither estimate is a perfect comparator and should not be taken as definitive, but they both suggest that the delivery costs emerging from the current pilot are very high.

However, the evaluation of the project suggests that there may be scope to further increase the proportion of new FP users from the current 24% to around 50%. If achieved, this would result in a reduction in cost per new FP user to a figure within the benchmarks.

It should also be recognised that the pilot's high unit cost estimates may be generated by the fact that we are loading the costs of training and materials production into just the first year, when in reality they would be good for several more years of EPI/FP clinics. We therefore model below an extension of the pilot for ten years to see the impact of spreading the costs over a more realistic period.

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[25] UNFPA, Guttmacher Institute, 2012. *Adding It Up: Costs and Benefits of Contraceptive Services Estimates for 2012.* New York: UNFPA, Guttmacher Institute. Available through: UNFPA website <https://www.unfpa.org/webdav/site/global/shared/documents/publications/2012/AIU%20Paper%20-%20Estimates%20for%202012%20final.pdf> [Accessed 9 August 2013]

[26] Morgan, A., Prasai, Y., Jimenez-Soto, E., Dettrick, Z. and Firth, S. 2011. *Developing an Investment Case for Financing Equitable Progress Towards MDGs 4 and 5 in the Asia Pacific Region. Nepal Scale Up Report. (Draft)* Brisbane: University of Queensland, Australia.

[27] Scenario 3, Mountain Cluster. In: Morgan, A. et al., 2011. Table 1, p.6, Figure 18, p.65, Figure 20, p.66.

6.2 VfM OF THE PILOT OVER TEN YEARS

In this case, we assume that the integrated EPI/FP clinics are repeated in Kalikot for ten years, with health worker FP training refreshed every five years (in this model, just once in year six), and materials renewed in one-quarter of health facilities every year. The number of users of the clinics is assumed to increase each year at the rate of the district's average population increase of 2.94% per year, with the share of those taking up FP for the first time set at the 24% achieved in the first year. Current levels of travel allowance/per diems for health workers are assumed to continue to be sufficient so no other incremental costs are included. No inflation is assumed, so the costs are in 2012 prices.

Under these assumptions, after ten years there would be a total of just under 3,300 new FP users, bringing the incremental recurrent cost down substantially to £9.55/$14.50 per new user (excluding FP commodity costs).

This is still higher than the benchmarks, but moves significantly towards them.

6.2.1 *Effectiveness*

It is possible to go further and look at effectiveness measures, such as pregnancies, infant deaths, maternal deaths, and Disability-adjusted Life Years (DALYs) averted. Using the Marie Stopes International (MSI) CYP calculator coefficients for Nepal,[28] and assuming that every new FP user continues to use for a full year (i.e. one new user = one CYP), the pilot may have generated the following range of outcomes in (i) one year and (ii) ten years, summarised in Table 2 below.

The MSI CYP coefficients are based on data for all women throughout their childbearing lives. However, our target group – women who conceive within two years of a previous birth – incur significantly higher maternal and infant mortality risks than the average.[29,30] To reflect this, we include an alternative estimate for infant and maternal mortality for the ten-year pilot, based on a doubling of the standard MSI coefficients for these two indicators.

6.2.2 *Cost-effectiveness*

We have been able to use the MSI CYP coefficients to estimate the cost per DALY averted (see Table 2 below). The generally accepted[31] rule of thumb is that an intervention can be regarded as cost-effective if it costs less than three times the current Gross Domestic Product (GDP)/head. Nepal's GDP/head in 2012 was $700 (£460).[32] We can therefore conclude that the integration of the EPI/FP clinics is highly cost-effective in terms of DALYs averted, even under the most costly assumptions. Furthermore, cost-effectiveness can be improved greatly if the clinics are continued.

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[28] Corby, N., Boler, T. and Hovig, D., 2009. *The MSI Impact Calculator: methodology and assumptions.* London: Marie Stopes International. Available through: MSI website <http://www.mariestopes.org/sites/default/files/MSI%20impact%20calculator%20 methodology.pdf> [Accessed 9 August 2013]

[29] Rutstein, S. O., 2008. *Further Evidence of the Effects of Preceding Birth Intervals on Neonatal, Infant, and Under-Five-Years Mortality and Nutritional Status in Developing Countries: Evidence from the Demographic and Health Surveys.* Calverton: Macro International Inc. Available through: MEASURE DHS website <http://www.measuredhs.com/pubs/pdf/WP41/WP41.pdf> [Accessed 9 August 2013]

[30] DaVanzo, J., Hale, L., Razzaque, A. and Rahman, M., 2007. Effects of inter-pregnancy interval and outcome of the preceding pregnancy on pregnancy outcomes in Matlab, Bangladesh. *BJOG: An International Journal of Obstetrics and Gynaecology,* 114(9), pp.1079-1087. Available through: National Center for Biotechnology Information website <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2366022/pdf/bjo0114-1079.pdf> [Accessed 9 August 2013]

[31] WHO, 2013. *CHOosing Interventions which are Cost Effective (WHO-CHOICE).* [online] Available at: <http://www.who.int/choice/costs/CER_thresholds/en/> [Accessed August 2013]

[32] World Bank, 2013. *Nepal.* [online] Available at: <http://data.worldbank.org/country/nepal> [Accessed 9 August 2013]

Table 2: EPI/FP Integration Estimated Delivery Costs and Outcomes for One-year and Ten-year Pilots

	Direct FP delivery cost per new user	Pregnancies averted	Births averted	Infant deaths averted	Maternal deaths averted	Total DALYs averted	Cost per DALY averted
One-year pilot upper bound (24% new users)	£36.00	163	107	5	1	40.9	£252
One-year pilot lower bound (18% new users)	£48.00	123	80	3	0.5	30.7	£336
Ten-year pilot upper bound (24% new users)	£9.55	1,869	1,227	52	10	468	£67
Ten-year pilot upper bound + excess postpartum mortalities	£9.55	1,869	1,227	105	20	…[33]	…

7 CONCLUSIONS AND RECOMMENDATIONS

The findings of this VfM assessment are more tentative than in previous case studies. The modeling of the outcomes is rudimentary, with important complexities in FP uptake among postpartum women and in second-round costs to the wider health system subsumed into a necessarily broad-brush method. However, the results suggest the following conclusions:

I. Initial estimates of the incremental recurrent costs of the EPI/FP clinic integration pilot in Kalikot are high. High up-front costs (of training, in particular) need to be spread over a number of years (amortised) by continuation of the clinics. We estimate that the integrated clinics need to be maintained throughout the district for at least 10 years for costs per new FP user to fall towards the benchmarks.

II. Costs per new FP user could fall to within sight of the benchmarks if either:

- the delivery costs were to be reduced by around 50%, or
- the proportion of new FP users were to be raised from the current 24% achieved in the pilot to around 50%.

III. The additional survey analysis in the final evaluation report suggests there may indeed be scope to move some way towards the latter through various technical improvements, such as in the way the counseling is given (e.g. by women health workers) or the privacy of counseling rooms, etc.

IV. Under all scenarios, the integration of FP provision into the EPI clinics is highly cost-effective in terms of DALYs saved.

[33] No CYP coefficient specifically for postpartum women was available.