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**POVERTY AND SOCIAL IMPACT ANALYSIS
OF
EXPANDED PROGRAM ON
IMMUNIZATION IN PAKISTAN**

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Abstract

The Expanded Program on Immunization (EPI) has been the exclusive provider of public immunization services in Pakistan for the last three decades. However, the country still has a long way to go before it achieves the EPI's objectives. By adopting a Poverty and Social Impact Analysis (PSIA) methodology, this paper carries out for the first time, an impact assessment analysis of the national EPI by focusing on its contributions towards Pakistan's social economy. Under the PSIA methodology, it has carried out an institutional analysis, a health and social service delivery analysis of the EPI by carrying out a survey of 2000 households across Pakistan, and an empirical analysis using micro-simulation techniques, which quantifies the EPI impact in terms of lives saved and workers added to the labour force since 1978. The overall finding is that a total of 0.15 million incremental workers have been able to join the labour force due to EPI activities post-1978. Based on the findings from its focus group discussions, household survey and micro-simulation analysis, the paper puts forward policy recommendations that are meant to guide the government as to how the cost-effectiveness of EPI can be increased in Pakistan.

Keywords: Health, Poverty, Expanded Program on Immunization, Social policy

Introduction and Background

Mismanaged child immunization and the prevalence of polio in certain parts of Pakistan are not only a national emergency but also a threat to the whole world. While global eradication of polio has almost been achieved, Pakistan is one of the only three countries in the world where this crippling virus still exists. This is despite the fact that efforts to eradicate polio and other fatal diseases began almost four decades ago, much earlier than its other neighboring countries that already have a polio-free certification today.

Serious efforts to eradicate polio and other fatal diseases in Pakistan were initiated in 1978 under The Expanded Program on Immunization (EPI). This Program aims to reduce infant mortality and morbidity by immunizing children against poliomyelitis, tuberculosis, diphtheria, pertussis, tetanus, measles, hepatitis B, pneumonia, meningitis, rotavirus, and haemophilus influenza type B. It also vaccinates pregnant women to protect them from tetanus toxoid and their foetuses from neonatal tetanus. The program was initiated by the World Health Organization and operates with assistance from the Government of Pakistan, the United Nations Children's Fund (UNICEF), and the Global Alliance for Vaccine and

Immunization (GAVI). In order to accomplish its two main objectives, the National EPI targeted to achieve 90 per cent routine immunization coverage of all EPI antigens with at least 80 per cent coverage in every district of Pakistan by 2010, and sustained coverage for reaching the Millennium Development Goals 4 and 5 by 2015. It may be mentioned that MDG 4 targets reduction in child mortality and MDG 5 is to reduce maternal mortality ratio by 2015. Moreover, the Program aimed to eliminate neonatal tetanus and interrupt polio virus transmission by 2012 and achieve certification by 2014.

Over the years, immunization coverage statistics (usually in terms of percentage vaccinated) for each antigen have been documented in several socio-economic and demographic surveys published by various governmental and international donor agencies. However, an impact assessment analysis of the National EPI since 1978 is yet to be carried out. This particular finding motivated the need for our current study. In order to carry out an EPI impact assessment, one must consider the policy impact on individuals or certain population groups (micro-level analysis), understand how the policy has been implemented over the years (meso-level analysis), and finally highlight the reform in the context of its effect on Pakistan as a country (macro-level analysis). In order to do so, we have adopted the Poverty and Social Impact Analysis approach since it consists of several techniques and tools that are used to comprehensively analyse socio-economic policies qualitatively and quantitatively at micro, meso and macro levels. As it will be demonstrated in the following sections, with the exception of a few, most existing studies on the EPI are either just perception based qualitative analyses, or quantitative studies involving descriptive analysis of statistics. Hence by carrying out a PSIA of the EPI, this study has an important contribution towards existing literature on the EPI and usage of PSIA for a health policy.

A social analysis examines the relationships that drive interaction at different levels in a society, including households, communities and other population groups. The fact that social norms and culture play a crucial role in 'governing relationships within and between groups of social actors' builds a case for social analysis. It complements economic analysis by using qualitative and analytical methods and tools to identify and explain the interaction between social, political, and institutional relations that impact the 'design, implementation, and impact of policy and that has a less-predictable impact on individual and group behaviour and relations' (World Bank 2007). Hence a PSIA examines the distributional impact of policy reforms on the comparative wellbeing of different stakeholders. By promoting the use of qualitative analysis along with empirical analysis, it

ensures that economic efficiency is not the only factor on the basis of which a policy is judged.

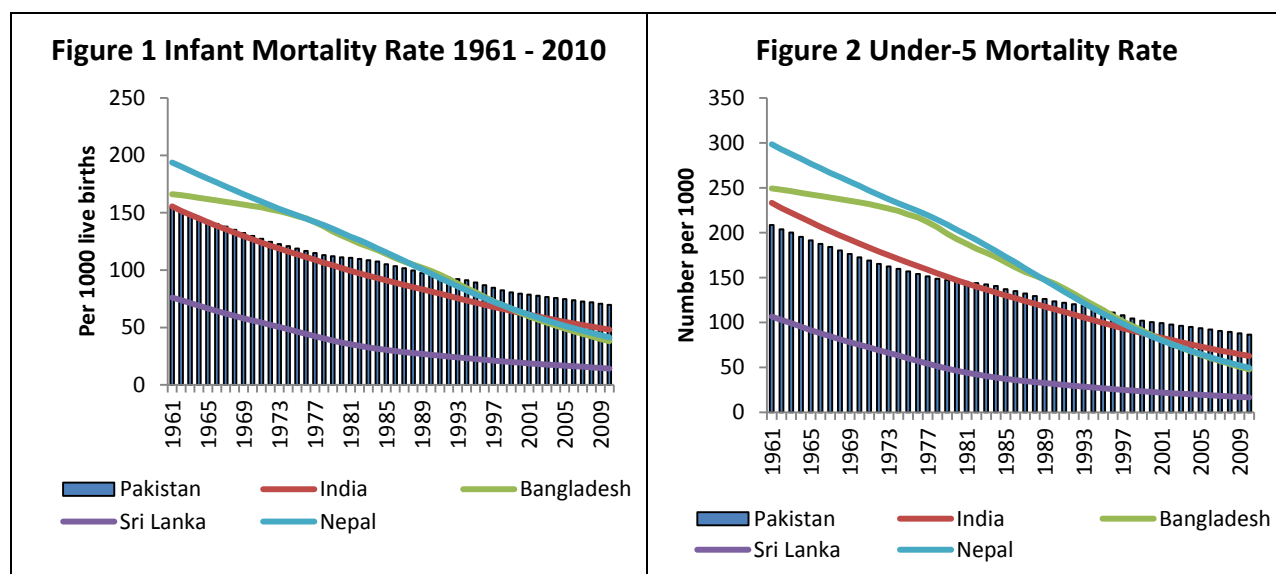
Therefore, by carrying out a PSIA of the EPI, this paper examines the intended and unintended consequences of the EPI on the welfare and wellbeing of different population groups (e.g. by gender, age and location) with a special focus on the vulnerable and the poor. In this paper, wellbeing includes income and non-income dimensions of poverty. It also elaborates the health as well as non-health factors adding to or detracting from the targeted impact of the EPI. Moreover, it assesses the possible impact of man-made and natural disasters on the delivery of the EPI and evaluate as if there are any significant differences in scope and effectiveness of the program in urban and rural context and to suggest reasons for these differences. Finally, the paper puts forward concrete recommendations to improve the program and maximize its impact by identifying the actions needed to implement these recommendations taking into account the socio-economic and institutional factors.

In the next sections, the paper reviews existing literature on the EPI, followed by a description of the data and a discussion on the adopted methodology, and finally presents the results that have been split into and explained via: an institutional analysis, a service delivery analysis, and a social, health and poverty impact analysis. The last section concludes with policy recommendations.

Literature Review

Since the health of infants in a country is directly linked to its future labour supply, economic growth and poverty reduction, children suffering from preventable diseases can pose a heavy socio-economic burden for an economy. This relationship between the infant mortality ratio and household level poverty is fairly well-established in literature (Cabigon 2005). An analysis of the secondary data from several national and international statistical surveys reveals that the infant and under-5 mortality in Pakistan remains high (Figure 1 and Figure 2) on account of peri-natal causes (20 per cent), respiratory infections (18 per cent), diarrheal diseases (17 per cent), vaccine preventable diseases (15 per cent) and malaria (7 per cent) (Ejaz et al. 2009). The regional comparison also indicates Pakistan's lagging position in achieving child health targets. Starting from early 1960s and until the start of 1990s, Pakistan had better infant and under-5 mortality rates if compared to neighboring countries such as India, Bangladesh and Nepal. However, around mid-1990s while the neighbors increased investment and capacity towards better service delivery of

immunization, Pakistan started to lag behind. Pakistan's efforts towards immunization were also affected after 2000 on account of war on terror and natural disasters – both of which made coverage more difficult.



Taking lead from the secondary data source, the Pakistan Social and Living Standards Measurement (PSLSM) survey, Table 1 indicates the province-wise coverage of fully immunized children across Pakistan. All provinces lag behind the terms of their stated goals in the existing *PC-I* (the official government document in Pakistan, which reports a social program's objectives and the ways in which they will be achieved within a certain period of time) for newborns and pregnant mothers. Balochistan and hard areas of Khyber Pakhtunkhwa in particular are most challenging for the EPI activities.

Table 1: Percentage of children 12-23 months that have been fully immunized (based on recall and record)

Region	2010-11	2008-09
Pakistan	81	78
Punjab	86	85
Sindh	75	69
Khyber Pakhtunkhwa	77	73
Balochistan	56	43

Source: Pakistan Social & Living Standard Measurement Surveys, several issues.

Similarly, an examination of district-wise surveys indicates wide differences even within provinces which explain as to how the neighboring districts may end up becoming a threat to the otherwise fully immunized districts. It was noted that regions in Musa Khel, Ketch,

Ziarat, Qilla Abdullah and Kohistan districts have under 40 per cent immunization coverage and require an area-specific remedial strategy, which should be participatory in nature so that the locals can help in regular access to the region. Some differences have also been noticed as regards immunization of male versus female children. In Table 2, we see for example in select districts how female immunization remained low in Rahim Yar Khan, Zhob and Larkana. Similar gender differentials have also been highlighted in the recently released National Nutritional Survey of Pakistan. It is, therefore, important to take into account the gender dimensions while reconfiguring a strategy for the effectiveness of EPI.

Table 2: Gender Differences in Immunization

District	At least One Immunization				Fully Immunized			
	Urban-Male	Urban-Female	Rural-Male	Rural-Female	Urban-Male	Urban-Female	Rural-Male	Rural-Female
2008-09								
Rahim Yar Khan	95	96	93	88	53	27	19	19
Larkana	100	100	87	84	86	100	75	73
Kohistan	90	91	76	69	0	0	8	21
Zhob	100	86	51	58	100	44	28	44
2010-11								
Rahim Yar Khan	100	100	88	81	54	40	15	14
Larkana	100	100	100	100	66	57	71	58
Kohistan	0	0	95	95	0	0	2	2
Zhob	100	100	100	100	14	34	67	52

Source: Pakistan Social & Living Standard Measurement Surveys, several issues.

The antigen-wise statistics on fully immunized children is provided in Table 3. While Balochistan remains a consistently low performer, we observe that in case of polio, Sindh, Khyber Pakhtunkhwa and Balochistan indicate low coverage by any conventional standards. The inter-provincial differentials also indicate towards variations in service delivery capacity across provinces.

Table 3: Percentage of Children 12-23 months that have been immunized by type of Antigen-based on Record & Recall 2010-11

Province/District	BCG	DPT1	DPT2	DPT3	POLIO1	POLIO2	POLIO3	MEASLES
Pakistan	88	88	87	85	81	81	79	82
Punjab	93	93	92	91	90	90	89	86
Sindh	83	82	81	79	71	71	70	77

Khyber Pakhtunkhwa	83	83	82	81	74	73	71	78
Balochistan	63	63	61	60	40	40	39	58

Source: Pakistan Social & Living Standard Measurement Surveys, several issues.

Several journal articles have also evaluated the recent performance of the EPI. For example, Owais et al. (2013) and Hasan et al. (2010) utilize secondary data from several WHO, UNICEF and government documents and statistical surveys to review the EPI coverage targets, constraints, resource allocation, costs, financial and other impacts of suboptimal performance. The key barriers highlighted in these papers include lack of parents' awareness hence low population demand for immunization, limited access to immunization services and weak management, social resistance to vaccines by certain population groups, civil conflicts and natural disasters, the devolution of national health ministry, and the inability of the district and provincial governments to tackle it as a national emergency.

Similarly, Owais et al. (2011) using randomized control trials, investigate if improving maternal knowledge of vaccines impacts infant immunization rates in Karachi. Results indicate that an educational intervention led by trained health sector workers from the same community and providing targeted pictorials related to vaccination for low-literate population, improved DPT-3 and Hepatitis-B vaccine completion rates by 39 per cent.

Another study by Usman et al. (2011) examines the determinants of third dose of Diphtheria-Tetanus-Pertussis (DPT) completion among children, who received DPT-I at some rural immunization centers in Pakistan. It concludes that specific targeting is required whereby immunization dropouts should be brought back on time to EPI centers. Based on data indicating new and old disease prone areas, existing EPI centers should be relocated and the government may consider creating new centers at locations that can reduce transportation costs and travel time, which in turn can also result in fewer immunization dropouts.

Mangrio et al. (2008) study the viewpoint and perspectives of health sector workers associated with immunization efforts in Sindh province of Pakistan. It reveals that National Immunization Days (NIDs) have led to thinning out of same immunization staff in turn implying an adverse impact on routine immunization coverage. Furthermore, routine immunization is being hampered by restricted mobility of health sector workers in their designated areas, lack of incentives to improve coverage, lack of private sector involvement, lack of interest on the part of facility based doctors, poor monitoring processes for routine immunization and political interference (e.g. in the movement of

health workers, recruitment of local health staff, etc.). The authors recommend that clear incentives and proper service structure should be in place for vaccinators, which can help to keep them motivated towards achieving EPI goals.

Khowaja et al. (2010) examine the sub-regional inequalities in EPI coverage and explains the reasons for immunization failure in rural setting of Pakistan. Using GIS information as well as the Population Census of 1998, the authors report that the proportion of fully immunized children is lower than what is being officially reported. The authors recommend chalking out of micro-level plans for tracking immunization progress at sub-district levels which can in turn help achieve universal immunization goals. Griffiths et al. (2004) study the incremental cost-effectiveness of supplementing immunization activities to prevent neonatal tetanus in the Loralai district of Balochistan province in Pakistan. It concludes that in comparison to other interventions, this supplementary activity led to a favorable cost per disability-adjusted life year – indicating an improved cost-effectiveness ratio.

Besides the above-mentioned papers, many on the ground challenges have been identified in various reports by public sector, development partners and independent consultants. Karamat (2004) studies vaccine security as a pressing public health concern. The performance of immunization program was undermined due to shortages in supply of vaccines. Such shortages are usually seen during times of high demand on account of national campaigns for polio, measles, maternal and neonatal tetanus. The author recommends revival of domestic vaccine production as a critical factor in ensuring vaccine security in future. Furthermore, the government will need to lay the correct incentives so that technologies for producing new combination vaccine can be made available in Pakistan.

Saadi and Virk (2009) also report child health challenges of internally displaced persons (IDPs) in host communities in Mardan and Swabi districts in Khyber Pakhtunkhwa province of Pakistan. According to their report, 75 per cent of households surveyed, informed that the immunization of their children was complete, however none of them possessed any documentary evidence to prove it.

The Acute Flaccid Paralysis (AFP) surveillance system for Pakistan reinforced the above concerns.³ According to most recent surveys there still are 15 high risk districts in the country. Out of these, 9 have exhibited persistent transmission and 6 are repeatedly infected. Amongst the major national level challenges outlined are a lack of shared

³<http://www.whopak.org/>

commitment at provincial and district levels, performance gaps in Balochistan and Sindh provinces due to poor on-ground accountability, security issues in Khyber Pakhtunkhwa and FATA and inequalities in routine immunization coverage across provinces and districts.

However, despite the above-mentioned work, several gaps still exist in the current literature that analyzes Pakistan's EPI. First, most studies are district specific and a scientific inquiry into regional differences in the performance of EPI as an organization remains missing. Second, the impact of climate change induced disasters and conflict on the EPI's progress has not yet been quantitatively investigated. Most studies at the national level are usually qualitative or descriptive, they lack rigorous empirical analysis and there is a dire need for quantifying the income and poverty impact of EPI in order to highlight its importance for Pakistan's economy. Exceptions such as Usman et al. (2010) and Owais et al.(2011) quantify their results using randomized control trials as their methodology but experimental research designs are unsuitable in order to analyze the impact of nation-wide programs or policies. Finally, since most of the literature on the EPI has been published in medical science journals, there is a need for more public policy oriented research that clearly defines the actions required to implement the general recommendations, which studies make in order to enhance the EPI performance. Similarly, the government's most recent policy documents such as The Framework for Economic Growth formulated at the Planning Commission and approved by the National Economic Council fall short of highlighting immunization challenge as a national emergency. In the light of above-mentioned issues in existing research on the EPI's performance, this study attempts for the first time to analyze the socio-economic impact of the EPI across Pakistan and over the past 4 decades, using both quantitative and qualitative approaches by utilizing the Poverty and Social Impact Analysis Methods.

Methodology: Poverty and Social Impact Analysis (PSIA)

For PSIAs to be effective at the national level, it is important to keep in consideration the relevance of PSIA to the current national priorities, timeliness of PSIA exercise, understanding the political economy around the reform process, engaging current and appropriate stakeholders, and a public awareness mechanism to control any skewed expectations (World Bank 2010).

We approach the methodology for this study through a mix of qualitative and quantitative methods. Under the qualitative analysis, a Stakeholders' Analysis of EPI's service delivery and an Institutional Analysis were conducted. For this we used participatory techniques

and carried out focus group discussions in the federal capital as well as in all provinces. The discussion on service delivery which follows is based on these focus group discussions. The institutional analysis is based on key informant interviews with federal and provincial EPI offices and related government departments. This analysis also embodies the views of independent professionals, who were interviewed during the process of this study.

For the quantitative impact assessment, we made use of a household survey and techniques from the micro simulation literature. The household survey was national in its scope and was based on a sample of 2000 households. While all provinces, including Gilgit-Baltistan and FATA regions are represented in the sample, we in fact sub-divided the provincial units into urban and rural regions out of which again a sub-division based on income groups (i.e. low, middle and high) was carried out. Respondents within each income group were then randomly chosen. The analysis that follows in the section titled 'social and health impact' is based on the findings of this household survey.

In order to estimate the poverty impact, we made use of overtime household income and expenditure surveys in order to simulate the impact of EPI in terms of lives saved and economic value addition of lives saved. It is difficult to attribute the entire reduction in infant mortality to the efforts of the EPI alone. However, in order to keep the analysis simple we used the decade-wise rural and urban elasticities of under 5 mortality with respect to the government expenditure on immunization since 1978. This elasticity is low and ranges from -0.12 to -0.17. Bokhari et al. (2006), Anyanwu & Erhijakpor (2007), and Bishai et al. (2006) discuss in detail on such elasticity measures.

Once the number of incremental lives saved (due to EPI activities across Pakistan) across time period 1978-2010 has been calculated then the next step was to simulate the education and later occupational profiles of these children. The rural child is assumed to join farm sector in the 15th year while urban child joins the non-farm sector of the economy in the 20th year. In reality there will be heterogeneity between urban children, some of whom may drop out and not go on to have college level education. This is why a safer option was to introduce the urban qualified and non-qualified in the labour market (non-agricultural) on average in the 20th year.

The time-series of rural farm sector per-capita value addition was computed overtime and multiplied by the number of saved children entering rural labour market in and after 1993. Similarly, the urban per-capita value addition was computed overtime and multiplied by the number of children entering urban labour market in and after 1998. Once this addition to GDP has been calculated then using growth-poverty elasticity for rural and urban

Pakistan we have tried to simulate the poverty gains achieved due to the growth contributions of saved lives.

In viewing our results, the limitations of the model should not be ignored. We have not allowed for behavioural changes such as migration between regions and sectors (which is highly possible under a detailed and realistic model building effort). We have also not allowed for individuals leaving the domestic labour market and joining the Diaspora. Similarly, for entry into labour market average years of training or schooling (formal or informal) have been considered (15 years for rural and 20 years for urban). In a more recent and informal setting Pakistan's rural youth may join the labour market much earlier. Finally, the returns to work in labour market are also assumed to be homogenous across rural or urban labour markets. The considerations of region-specific wage distortions have not been considered. Therefore, our results may be regarded as more on the conservative side. However a detailed sensitivity exercise reveals that changing the entry years into labour market and changing the average per-capita value addition within a range that qualifies for regional variations does not significantly alter the direction of our results, however, the magnitude of estimates may vary.

In order to validate our qualitative and quantitative assessments we have made use of existing statistical surveys that are available for public access. These include PSLM 2010-11, which provides the most recent district-wise assessment of full immunization, EPI District Coverage Evaluation Survey, Pakistan Health and Demographic Survey, Geographic data including EPI coverage maps. Most of our results reinforce the findings of these nationally representative surveys. Similarly our estimation for increase in national income has been kept in line with the methodological approach followed at the Pakistan Bureau of Statistics.

Institutional Analysis

At the time of writing of this paper, the EPI institutional framework in Pakistan stands fragmented and ambiguous. There is an Inter-provincial Committee on Polio, which is taking lead in the implementation of National Emergency Plan for Polio and is housed in the Prime Minister's Secretariat. No specific documentation was found as to how this committee liaises with Federal or Provincial EPI units. Going beyond national and towards sub-national domain, it is still not clear that if Federal EPI office will continue to exist for another PC-I period of 5 years under the administrative control of Ministry of Inter-provincial Coordination, what specific linkages will be there between federal and provincial EPI office. Questions arise as to how the two layers will liaise in terms of overall program

implementation, engagement with development partners, procurement, standards management, quality assurance, monitoring and evaluation.

The contours of our institutional analysis were also framed in the stocktaking workshop held on 3rd January 2012 at the Sustainable Development Policy Institute (SDPI), Islamabad. The meeting was attended by representatives from Ministry of Finance, Planning Commission, officials from now devolved Ministry of Health, Federal EPI office, members of medical community, development partners (UNICEF, WHO, World Bank and UNDP) and representatives of civil society organizations.

The meeting noted that this PSIA must at the outset assess the relevance, cost-effectiveness, key objectives and sustainability of the program. Most stakeholders noted that while the relevance and cost effectiveness was already established in national and international literature, what is more important at this stage is to see how far is the EPI progress from its objectives. Going forward then what should be the institutional architecture of EPI in Pakistan that may ensure sustainability across time and space.

The federal EPI office emphasized that greater media coverage is carried out for polio where as some balance is required so that importance may be given to other preventable diseases as well. Given the overall state of governance in the country putting in place a robust monitoring and evaluation system is always difficult. Tracking measures such as wall chalking are often ineffective particularly in regions where EPI is resisted on grounds or norms, culture or traditions. Some level of success is possible if immunization card is made mandatory for admissions in the school. Similarly further capacity is required for prudent stock management. In various districts, there are complaints that the vaccines stocks deplete while in other districts there are excess amounts available. On various occasions, EPI staff end up handling court issues and complaints, which occupy a significant proportion of their work time. There is a need to put in place a separate nation-wide grievance redressal mechanism. The issue of political appointments in the EPI activities is also concerning. The politically appointed EPI vaccinators do not deliver and on many occasions have not visited their designated area.

A World Bank representative observed that EPI has developed a strong basis for service delivery with an adequate number of staff and service points. There is a lot still left in the original agenda of delivering immunization to all the eligible children, however, the program has made progress. The program base has been developed and it has delivered to a large degree reducing the burden of morbidity and mortality due to these diseases over time. However, the program performance in terms of coverage remains inadequate with

significant differential between urban and rural income groups, and inter-provincial variations – the recent performance is of key concern and has implications for future program expansion. The program is still too dependent upon public sector and does not use private sector to deliver these services. The private sector can add value to the far flung areas where routine immunization services are not functional in addition to creating awareness, dealing with refusal cases and follow up.

The representative also observed that while it has been established in the literature that immunization is cost-effective and factors such as mother education have high cost-effectiveness ratios, there remain serious on-ground issues in the entire supply chain. Vaccines are being procured based on fictitious population estimates. Provinces do not have an incentive to go in the field and collect data on population to be covered under vaccination. Unless there is an integrated accountability framework in place that binds the national and sub-national priorities of EPI it will remain difficult to achieve the objectives.

Public awareness is one of the weak areas of the program and recently, it has not been supported by a strong push to improve public awareness. The modalities to improve awareness have focused mostly on print media unfortunately with the very large illiterate population that would be a poor choice.

While calamities such as floods have hindered work, however the fact that the EPI has not been able to achieve its objectives in areas where no such events occurred is a cause for serious concern. It shows that the floods were certainly not the only factor explaining the low level of achievements. The key hurdle for the program is poor management and lack of accountability for results – no changes have been made in program management despite successive years of poor performance.

The World Bank's own assessment reveals that the major causes for delay are: irregular immunization sessions which could be due to unavailability of staff or vaccines, access to new born, lack of follow up, poor micro planning which could be used for better targeting, lack of coordination between community and facility based teams, Inadequate supervision and monitoring, overall poor planning and execution.

A representative from World Health Organization observed that Pakistan was never declared a polio-free country for various reasons, which still persist. The birth registration in Pakistan is low and therein starts the problem of targeting. While finances and human resources are available, the lack of accountability in general and monitoring and evaluation in specific are hindrances in the achievement of EPI objectives. At many places the household level cluster survey reveals that vaccinators do not visit once in the whole year.

Owing to lack of awareness and misconceptions, there is no pull factor from the household side (particularly in the hard areas). Across province capacities and capabilities in managing EPI activities greatly differ. Such variations need to be narrowed.

According to the civil society representatives, the key immunization barriers included: a reluctant attitude towards children's and child-bearing mother vaccinations, low access, lack of fixed EPI centers, lack of management and knowledge of the immunization staff, living in areas with less number of health professionals, and the lack of knowledge regarding the importance of vaccination. On the ground, the major difficulties faced by the health staff are in areas with low socioeconomic status and weak parental educational background. Creating and disseminating knowledge requires communication in native language, which is usually not the case as most EPI publicity material is printed in Urdu language. Therefore, language barriers must be overcome.

Social setback is also due to the conservative attitude that does not allow women leaving their homes and male teams entering their homes, and the general male attitude towards LHWs is also a hindrance in conveying the message. A problem faced in Pakistan and Afghanistan is also the misconduct against EPI campaigners and health staffs. The underlying problem in developing regions has been identified as the low parental knowledge of the significance of preventative medicine.

Finally, it is important to mention that challenges need to be kept in broader perspectives. As we will show later that EPI has led to saving of incremental lives which have had a positive economic impact. Therefore, for the planning cells or inter-provincial committee to be effective it will be necessary to build upon the existing strengths and opportunities provided by the EPI's historic performance.

Service Delivery Analysis

Comprehensive focus group discussions and key informant interviews were held with various stakeholders, including provincial EPI offices and EPI staff in order to evaluate EPI's service delivery. In what follows we provide a province-wise exhibit.

PUNJAB

The EPI workforce in the Punjab claimed to be satisfied with the level of their effort. Through fixed site/outreach/NIDs, they reported to be working towards delivery of vaccines and creating awareness about the program. They were of the view that it is easy to deliver where LHW / Midwife from the same area provides support to EPI. It was, however,

reported that there are challenges for the vaccinators that are deputed to cover populations, which are widespread geographically and vaccinator is expected to cover long distances without adequate transport and logistical support. The supplies of vaccine provided by the federal government (on the basis of obsolete population estimates) were found enough for eleven months instead of full year. The staff manages the last month by splitting the vaccine of eleventh month. It is usual to see districts sending written intimations about the finishing of vaccines and requisitions for top-up.

There are also delays in the hard areas, where large union council is given to one vaccinator, low performing workers with political support, and areas where there is shortage of funds to cover transport related costs. It is important to note that the classification of hard areas changes depending upon the law and order situation in the surroundings.

Maintaining the quality of vaccine is important in order to achieve optimal results. While most reported to make efforts in order to maintain the quality in the best possible manner, however, electricity load shedding was reported as a major challenge. As the refrigerators at the cold chain are ice-lined, that could maintain the temperature for 18 hours. However, this time varies depending upon the frequency with which refrigerators are accessed. The electricity failure for long time and at high frequency makes it difficult to manage the cold storage as these refrigerators need buffer time to maintain their temperature up to standard.

In terms of contingencies and natural calamities impacting the EPI performance, it was reported that apparently floods in the Punjab do not have direct impact on the program performance. The program tries to deliver in the flood-hit area through special teams. In terms of procedural hindrances faced by EPI staff it was reported that supervisory staff faced political interference when they tried to forcefully get the delivery of services from lower staff. Most of the population do not resist and get their children vaccinated. There are some *Hakeems*/local religious icons/well off (rich) population, who refused to take this service and even sometimes threatened the staff. Such refusals are always booked in the refusal log of the respective area. The commonly heard and misperceived arguments include: negative impact on the reproductive fertility, injections not good for overall health, vaccination programs part of foreign agenda against Muslim population growth, and vaccines carrying *haram* (religiously forbidden) contents.⁴

⁴Some of these concerns have been highlighted in earlier evaluations of EPI in Pakistan. These includes PDHS 2006-07, CES (2003, 2006), Faisal et al. (2009).

The role of politicians needs to be highlighted. Most of them still do not attach high priority to EPI activities in their area. Sometimes members of national and provincial assemblies are requested to chair inauguration ceremonies and awareness campaigns. However, many politicians refuse such requests perceiving this to be a waste of their time. This calls for continued efforts at parliamentary levels in order to educate particularly the members of national and provincial assemblies from hard areas. PILDAT (2010) highlights some more venues where political community can help deepen the impact of EPI.

Regarding the monitoring of EPI in the Punjab, it was learnt that except the deployment of six officers in EPI office in Lahore, there is no mechanism of physical monitoring in the province.⁵

SINDH

The respondents (particularly the officials) were not very satisfied with the overall performance of EPI, given that coverage still remains less than satisfactory. In many major cities, EPI has signed MoUs with private hospitals to extend the vaccination coverage. However, no official reports were available to suggest operationalization of these MoUs. The NIDs coverage met a level of 95% in each district. Now the program is chasing the target of 95% in each union council. However, NIDs affect the routine immunization by consuming the human resource and planning/supervision efforts of EPI staff. The overall results of the EPI could be enhanced by lowering the frequency of the NIDs (e.g. not more than four per year).

It was highlighted that in order to make Pakistan polio-free, efforts beyond NIDs are required. These may include (but should not be limited to) improving overall nutritional standard particularly in rural areas and female children, expanding public awareness program with particular focus on women education, and improving overall hygiene particularly in flood-hit areas. In urban areas, it is easy to carry out such awareness campaigns, however, new and innovative methods are required for rural population. The urban population also has a pull-factor in demanding EPI services, which also act as a motivation for officials. Such a pull-factor still needs to be developed in rural population whereby poorest of the poor also raise voice in order to demand such important health services.

Some recent exogenous factors have hampered the operations of the EPI. There is the issue of access due to law and order in some areas of Sindh province (for example in Ghotki).

⁵This also needs to be ascertained if 6 officers are adequate for 36 districts.

Owing to this, the activity in these troubled areas is managed in intervals with the help of police and local influential persons. Floods also caused serious problems for the EPI in Sindh. They caused displacement of population and deteriorated the hygiene in the surroundings. The program targeted these areas with special efforts but it still remains challenging. Moreover, in Sindh where the vaccinator is not local there are serious deficiencies. Some are unable to relate to local population, therefore, do not have persuasive powers over refusal cases.

There are no major issues in the maintenance of the vaccine quality in NIDs as donor funding is satisfactory. For routine immunization, funds are usually provided by the government. In this case, load-shedding affects the vaccine quality. However, generators and solar refrigerators are arranged at district level. It may be noted that timely inputs for such generators is constrained due to budgetary lapses. Furthermore, it was reported that there is no regular or systematic monitoring on the quantity and quality of the vaccines and services delivered. The staff responsible for the maintenance of vaccine temperature particularly in hottest areas of Sindh requires monitoring. We found no recent evidence where it was reported that expired to heat-affected vaccine was disposed away, which is rather surprising given the number of cases which have been affected by for example polio, despite receiving vaccine. Usually, the reason cited is expiry of vaccine, however, the manner in which the instances of expiry are reported from lowest to higher ranks in EPI offices was ambiguous.

In Sindh, the commitment of local political leadership was appreciated as they regularly appeared on NIDs to signify the importance of immunization. However, like in the case of the Punjab, it was reported that political influence existed at the time of recruitment, posting and transfer of the EPI staff. For one of the major districts of Sindh it was revealed in confidence by a senior EPI official that over one hundred vaccinators were recruited due to political pressure and these had not been regularly visiting their designated regions. This claim was validated through our household survey as well. The representative of WHO in our stocktaking meeting also highlighted this issue.

KHYBER PAKHTUNKHWA

In overall terms, our interaction revealed mixed level of satisfaction amongst EPI officials and stakeholders as regards program performance in Khyber Pakhtunkhwa. While appreciation was expressed by most that intensive efforts are underway for achieving the program objectives, however at the same time there is no room for any complacency as the coverage is not even near to the targeted goals and outbreaks are being regularly reported

for diseases vaccinated under EPI. The key problems highlighted included: the volatile law and order situation, low capacity of human resources, and incorrect preconceived notions about the EPI. The climate change induced natural disasters such as 2011 floods have also led to damaging of the EPI facilities and exacerbated the challenge as the population migrated.

The provincial EPI officials want the involvement of private sector in order to share the burden of ongoing challenges. For universal coverage, it was pointed out that creating a framework for public private partnership is imperative. The private hospitals are being encouraged to have some trained EPI technicians and vaccinators for which EPI will bear the responsibility of training, followed by provision of free vaccine. Several private practitioners were of the view that it is not possible to expect from the private sector to bridge the coverage deficit. The private hospitals will never be able to situate themselves in hard areas where there is problem of law and order and the patient's capacity of pay for services is low (even if government subsidizes operations). In terms of stock management it was pointed out that as the coverage was less than optimal across the province, therefore, often there are remaining stocks of vaccine in balance.

On the overall performance of the NIDs, it was reported that the NIDs are helpful in achieving polio related targets and NIDs are currently carried out 8-10 times per year. There is a definite positive impact of NIDs on polio but it also hampers the vaccination of other diseases. The NIDs impact can be further enhanced by motivating the existing workforce through monetary and other measures at the same time ensuring accountability. There are some who remain suspicious of heavy emphasis of national and international community on polio related efforts. The cultural norms in certain areas do not allow male EPI members to provide injections to females. There is a need for recruiting more female vaccinators for Khyber Pakhtunkhwa so that there may be adequate comfort level of local community with EPI staff. There have been some added fixed costs, which had to be incurred in the wake of electricity shortages. Both load-shedding and low voltage poses challenges for managing the cold chain.

Finally, no effective field monitoring of the program is in place. There are weak supervisory roles and poor quality of data collected due to which the planning process remains weak and information is lacking on strategic issues such as approaching key hard areas. Members of political parties also hinder operational efficiency through their meddling in to appointments, postings and transfers of EPI officials.

BALUCHISTAN

This province unfortunately had a low turnover of health sector officials in our meetings. Owing to the deteriorating law and order, experienced public health professionals (including those involved in the EPI) have opted for out of province postings. The overall EPI coverage is still less than 50 per cent. The process of restructuring of EPI organization in Baluchistan is underway. A focal person from the government (Additional Secretary – Health) is now in place and a recent evaluation of the program has been conducted to find out the missing links, lagging areas and accountability considerations. Previously, there has been no accountability on the activities of the program and the process of making District Coordination Officers accountable for their respective district is also underway. Private hospitals and clinics in the provinces are being considered to mainstream EPI activities so that public sector service delivery can be augmented. While most of the above- mentioned was explained by officials in verbatim, no documentary evidence was available to attest this.

NIDs end up taxing the existing staff of the EPI as seen in case of other provinces. This in turn impacts the efficiency of routine immunization activities. In order to resolve this issue Baluchistan has requested WHO and UNICEF to provide services of their already working staff in districts such as social mobilizers. An agreement on this is still to be reached. It was reported that while population from Baluch belt seems more aware and cooperative towards EPI activities, the problem sometimes comes from the Pashtun belt that lacks awareness.

Law and order remains a major issue in extending the coverage. Whether it is a fixed facility, outreach or mobile activity there are many areas where the EPI officials and staff cannot operate at all or in a timely manner. Nearly in each district there are such troublesome silos and sometimes it is the whole district like Kohlu and Dera Bugti. Owing to lack of education in this region, parents are also not demanding timely and efficient service delivery. It must be recognized that Baluchistan has the highest geographical spread and the distance itself becomes a challenge for many vaccinators. While low levels of female staff in the EPI is an issue as seen in case of Khyber Pakhtunkhwa, for Baluchistan this problem is even more acute because in many areas females are not allowed to work outside of their homes. If females are recruited from other areas, they are not allowed by the community to roam around in the area and interact with households freely. Hence this behavior requires colossal level of social mobilization activities in this area, which can mend behaviors.

Finally, it was noted that the delay in the logistics and service delivery is also due to less vaccine carrier vans and cold rooms. The absence of electricity supply, load-shedding and low voltage particularly in remote districts imply difficulties for cold chain process. Owing to the excessive geographic spread of the province it becomes difficult to manage the efficacy of vaccine through cold chain. While the demand for more cold rooms has been put up several times at district level, it is yet to be physically executed.

Some General Issues

We believe that it is essential to regularly assess how abreast the EPI staff is with current developments in the EPI practice. In the course of this study, limited record was found on how regular personnel and staff received refresher trainings over the course of three decades. For most part, training component was not built in the program as a recurrent activity and only occurred on sporadic basis. We were also interested if those who attended such trainings also disseminated the thoughts to their subordinates. As there was no central monitoring and evaluation system of management practices, such feedbacks could not be attained. The traditional source of capacity building, i.e. training programs was not optimal in their effectiveness. In our discussion, we were informed for incidences when on the basis of favoritism wrong or irrelevant staff members were sent on trainings. On one such occasion, Minister's personal secretary (who only had his prior experience in secretarial services) was also sent abroad.

At the macro and meso level, several *standard operating procedure* documents were written such as the one by Technical Assistance Management Agency on managing and ordering vaccines for Union Council level [Ministry of Health (MoH) 2007]. While most of these were written and structured in good intent, it was rare to see a follow up or appraisal on how this disseminated knowledge actually penetrated the various administrative and service delivery tiers of EPI offices. Like the training appraisal, communications appraisal was also found missing. While information in such documents was found comprehensive, several issues prevented the actual knowledge diffusion primary of which was language barriers.

The revelations from the provincial focus group discussions (FGDs) explain that the timeliness of budget releases plays an important role in the availability of vaccines and vaccinator. Our household survey had ample anecdotal evidence where parents were turned away from the health facility because the vaccine stocks had finished and new stocks were still awaited. When we informed about this to the federal EPI office they were of the view that poor management and oversight at provincial level was the main cause.

According to them there was no issue of budget availability or vaccine stock management from the center.

With 18th Constitutional Amendment in place, provinces will, in due course of time, need to assume full responsibility of programs such as the EPI. The issues about budget and capacity building will remain in place. Therefore, while moving forward it is essential that provincial governments urgently start putting in place, results based management for outcomes based approach towards national programs of importance. This, however, will require strengthening of Medium Term Budgetary Framework wherein key performance indicators are regularly monitored.

As regards the capacity building sphere, provincial governments will need to build their own mass of professionals with desired capabilities at the district level, and regular refresher programs may be arranged for the entire supply chain. However, at the federal level, mechanisms are required to ensure minimum standards of the EPI's service delivery throughout the country. Federal government can do this through regular training of trainers program whose contents may be structured under supervision of local and foreign experts. Such trainings should then be supplemented with training follow ups in order to evaluate the effectiveness of such endeavors.

The monitoring and evaluation will continue to be a grey area unless national and sub-national policy and planning tiers of EPI come together to devise an integrated medium term strategy. This can be steered by an inter-provincial committee, however the leverage for this needs to come from the very top, therefore, political ownership of monitoring, evaluation and feedback mechanism is important.

Our concerns highlighted above have also surfaced in recent literature. Karamat (2008) had recommended for polio eradication a strategy based on: a) ownership and accountability of officials and staff, b) supplementary immunization activities and their monitoring, c) surveillance and surveillance reviews, d) building and monitoring communications strategy, e) strengthening commitment towards routine immunization, f) carrying out five years detailed analysis based on age, gender, region of routine immunization in each affected district in order to conclude the reasons for failure and occurrence. Reinforcing these arguments, Shah et al. (2011) also cited for polio the insufficient number of vaccinators, their lack of commitment and at times knowledge deficiency of vaccinator in problem areas as key issues. There was also for a large number of cases deficiency of 2nd and 3rd booster dose.

Mushtaq et al. (2010) summarized perspectives from the EPI staff into: a) resources and logistics – poor condition of cold chains, poor skills and authority in resource allocation, lack of HRM standards, limited resources for advocacy and outreach; b) technical aspects – general deficiency of professional practitioners; c) operations and management – ineffective performance evaluation, political and bureaucratic influences, problems of mobility and security, lack of compliances with immunization cards, lack of birth records at health facilities, and poor linkages between different preventive programs; d) monitoring, evaluation and feedback – unreliable reporting and poor monitoring systems, limited use of local data for interventions, unclear roles and responsibilities (particularly after fiscal and administrative decentralization).

Javaid et al. (2009) validate our proposal for nation-wide maternal education programs on immunization. The authors note that an improved socio-economic status does not necessarily imply greater awareness and knowledge about immunization, therefore, the importance of maternal education cannot be ignored. There are examples across other developing countries where targeted interventions were made to increase maternal education particularly in affected areas. Such interventions require investments and human resources, as they need to be customized according to the affected area. It is also understood now that even widespread public awareness programs can also not substitute for targeted maternal education. Ahmad et al. (2008) show that despite campaigns (such as NIDs), a significant number of children end up missing vaccination during the time of campaign.

The above-mentioned issues get exacerbated during times of conflict and natural disasters. For example, Saadi and Virk (2009) show that when IDPs were interviewed, 75 per cent reported to have been completed immunization, however, no evidence was available to prove such reports. Almost 80 per cent of women IDPs did not have antenatal care.

Finally, a clear vision is required as to how the EPI will be governed once the time period of current PC-I ends. It is evident from our province-specific discussions that they wish to assume the entire control of supply chain for the better service delivery, which is according to their plans and priorities. This is reason for recommending a Planning Cell at the provincial EPI offices. In order to further refine the process and give control of EPI to the provincial governments, our recommendation will be to allow provinces to come up with their own PC-Is at the provincial level. This will allow the provinces to build their planning and implementation capacity besides carrying out recruitment and procurements in accordance to their own priorities. Each PC-I should be thoroughly discussed and approved after detailed examination by the *Committee to Guide and Monitor* the provincial EPI office.

Social and Health Impact

As part of this study, we conducted a survey of 2000 households across Pakistan. For every selected district, a mix of urban and rural households was ensured. Within this classification it was further ensured to maintain a mix of low, middle and high income households (which were randomly selected).⁶The district-wise distribution of respondents indicates that highest proportion of households belong to rural Punjab, which is in line with the population criterion. In case of Punjab province, Bhakkar, Layyah, Gujranwala and Lahore districts were considered. For Sindh province, Larkana, Karachi, Dadu and Sukkur districts were selected. In Khyber Pakhtunkhwa province, Peshawar, Abbotabad, Mardan and Bannu were considered. Finally in Baluchistan province, Quetta and Gawadar were interviewed.

Majority members of households, who were interviewed, were heads of households (45 per cent) followed by father of head of household (19 per cent), spouse of head of household (17 per cent) and eldest child of head of household (12 per cent). The age group of respondents was mostly between 20-40 years (68 per cent) followed by above 40 years category. Around 81 per cent of the respondents were living in a joint family type. There were 81 per cent families, who had less than five children and 18.6 per cent had between 5-10 children.

In terms of the employment status, 29 per cent were involved in some form of self-employment activity, and around 28 per cent were paid employees. In terms of income status, 44 per cent reported having monthly economic proceeds of over Rs 15,000. This was followed by 22 per cent who reported incomes between Rs 10,000 to Rs 15,000 per month.

Specifically on the subject of household's health, nearly 40 per cent reported that head of household in his role as husband, has leading role in decision making on health related matters. For 65 per cent households, the monthly expenditure on health was less than Rs 3,000. However, there were around 20 per cent respondents, who had monthly health expenditure of over Rs 6,000.

In case of access to a health facility, we were interested to learn what type of health facility was nearest to the household. However, it was soon realized that a health facility being nearer did not imply that a person or family necessarily prefers this facility for mother and

⁶As per methodology of Pakistan Bureau of Statistics, households from Gilgit-Baltistan and FATA have been shown under Khyber Pakhtunkhwa. This is in line with the population census weighting regime.

child health care. (This is because of various reasons, such as lack of expertise, lack of female attendants at the facility, etc.) When asked about the preferred health facility in the region, 48 per cent reported this to be a hospital followed by clinics. When asked about the distance to preferred health facility, 43 per cent reported the distance to be between 1-4 kilometers. There were 5 per cent households, who reported that the distance was more than 5 kilometers. When asked about the time taken to travel towards the preferred health facility, 51.6 per cent said that it was less than 10 minutes. There were around 17 per cent who reported this time to be up to 40 minutes, and 1 per cent reported over 40 minutes travel time. The monetary cost in reaching the preferred health facility was under Rs 50 (at 2010-11 prices) for about 70 per cent of the households. There were 5 per cent households, who reported having paid over Rs 200.

Most households were not fully aware about the available options at the health facility. Therefore, we asked them to report availability of male or female doctors, LHW, dispenser, technician etc. While 26 per cent reported having seen a male doctor at the health facility on regular basis, only 1 per cent had seen a female doctor on regular basis. Female dispersers/technicians and LHWs had been regularly seen by 11.6 and 4.5 per cent respondents respectively.

On specific questions regarding vaccination activities, 12 per cent households reported that the vaccinator did not visit their area regularly. All who had observed this had no information about the grievance redressal mechanism (if it exists). We also studied the district-wise status of immunization. A child was termed fully immunized if parents could produce the health card and child had received vaccination, including BCG, DPT1, DPT2, DPT3, Polio1, Polio2, Polio3 and Measles. This definition is in line with the definition of fully immunized children used in PSLM 2010-11 conducted by Pakistan Bureau of Statistics. The performance of EPI across districts seems asymmetric. For example, within Sindh province, while Karachi, Larkana and Dadu reported an above 70 per cent full immunization, Rohri – a tehsil of Sukkur district only showed 52 per cent (which is why we have shown Rohri separately in case of Sindh province). Similar picture is seen in Baluchistan where Quetta reported 74 per cent while Gawadar only reported 31 per cent fully immunized children. As the survey team was unable to visit the hard areas of Khyber Pakhtunkhwa and Balochistan (due to security reasons and lack of official permission) therefore, our results cannot indicate the overall provincial status.

There were 22 per cent households, who reported that they were unaware of any EPI initiatives (such as NIDs) in their area. The level of health awareness was generally found poor as 47 per cent of households reported that they did not know if immunization

prevented disease. Those who were aware of EPI activities were asked if they endorsed the overall immunization exercise. While 16.4 per cent remained indifferent there was 1.1 per cent who said they did not endorse these activities. The reasons provided for non-endorsement included lack of information about the contents of vaccines, perception of community elders that this vaccine is western scheme to curtail local population and some were of the view that this is only an excuse to survey the local area and find out the miscreants. This view has gained strength after the US raid in Abbottabad.

All households were asked if they had a chance to observe EPI awareness campaigns in print and electronic media. It was reported by 23.2 per cent households that they had not come across such campaigns. Those who had expressed some awareness about these campaigns were further asked about the precise source of such information. It was reported by 54 per cent of these households, that their sources of information were Lady Health Workers (LHWs) and local immunization teams. Around 21 per cent said that they had received information from public banners, local mosques and NGOs, and 17.8 per cent reported TV/Radio or newspaper as their source.

We also asked for the households' own perception regarding the key hurdles in the vaccination process. This question was asked to those respondents, who endorsed EPI initiatives. The most important reasons cited include: lack of public awareness campaign, lack of decent and properly staffed health facility situated locally, time constraint (particularly where male members are away from home due to occupational reasons), lack of female members in vaccination team, lack of support from spouse and fragility in the area.

In order to validate the results from our survey, we resorted to PSLM 2010-11 data and found that with some exceptions the direction and magnitude of our estimates was very much in line with the findings of PSLM. Similar comparisons were also carried out with the EPI coverage data provided by the Federal EPI office. Our information on coverage was noticed to be particularly low in case of Bhakkar and Gwadar vis-à-vis PSLM 2010-11.

Table 4: Comparison between Recent Survey Data

	PSIA 2011-12*	PSLM 2010-11	PSLM 2006-07
Karachi	83	87	82
Larkana	78	82	78
Lahore	88	87	83
Gujranawala	78	88	84
Layyah	80	91	89

Bhakkar	76	94	93
Abbotabad	96	78	79
Peshawar	91	87	86
Mardan	93	87	91
Bannu	74	61	46
Gwadar	31	62	54
Quetta	74	73	75
Dadu	73	79	70
Sukkur	52	65	63

*Carried out as part of this study

A central conclusion that comes out is that a lot of misgivings and confusion persists about EPI activities among masses. There is an urgent need to revise the strategic communications plan (if there exists one) in order to use formal and informal means of communication.

Our survey results mentioned above are in line with existing studies on the subject. Qidwai et al. (2007) surveyed educated segment where 73 per cent had graduate or postgraduate qualification. There were 6 per cent respondents who still believed that immunization does not prevent disease. Only 58 per cent said that they would recommend vaccination to others. Around 80 per cent had at some point in their lives heard about harmful effects of immunization mainly from their friends and parents. This study also reinforced the conclusion about initiating public debates on this issue particularly in mass media.

Similarly Naeem et al. (2010) investigated coverage and factors associated with Tetanus Toxoid vaccination among married women of reproductive age in Peshawar district. The results showed that 56 per cent were vaccinated and key reasons cited for not getting vaccinated included lack of awareness, heavily engaged due to household commitments, health facility being far from home, misconceptions and fear of reaction. This study also concluded with the need for effective public awareness campaigns (on maternal tetanus vaccination). Furthermore, authors suggested that lady health workers should be mobilized for increasing vaccine coverage in the area. Nisar et al. (2010) on Sindh Province also concluded that coverage of tetanus toxoid vaccination remains below WHO universal standards. Main reason for this in Sindh continues to be lack of knowledge among pregnant women.

Ahmed et al. (2001) had concluded over a decade ago that even general practitioners in Karachi district had poor knowledge and incorrect practices for tetanus immunization and in turn recommended interventions such as seminar and displaying of immunization protocols in health facilities. A tracer or similar study should now be conducted on where the knowledge of general practitioners currently stands. It may be noted that many private

practitioners do not enter into refresher courses during the entire course of their work related service.

Given public sector's recurrent inefficiencies in implementing a robust communications strategy it is now apt to recommend that private sector should be involved (after keeping in place clear oversight and regulatory procedures). There is evidence to suggest that private sector has better penetration through formal and informal communication channels. Something closer to our suggestion (e.g. public private partnership) was also recommended by the government (MoH2009), and Haq and Qazilbash (2006).

Andersson et al. (2005) also recommended a two-way communication, which has evidence from local and global sources. They pointed towards the need for documenting cultural and contextual barriers to immunization. Information should be targeted towards health managers on correct practices and effective communication. At the same time communities should be made fully aware about the effects and side-effects of immunization.

These interventions can be made more cost-effective if synergies are created and sustained across federally funded vertical programs in health sector. For example any reforms in the LHW initiative must reflect their contribution to EPI activities. LHWs can exert their influence in the immunization process on most occasions more effectively than the vaccinator given the female's greater congeniality with the local women (Khan 2011). Similar synergies can be created through integration of family planning and immunization services.

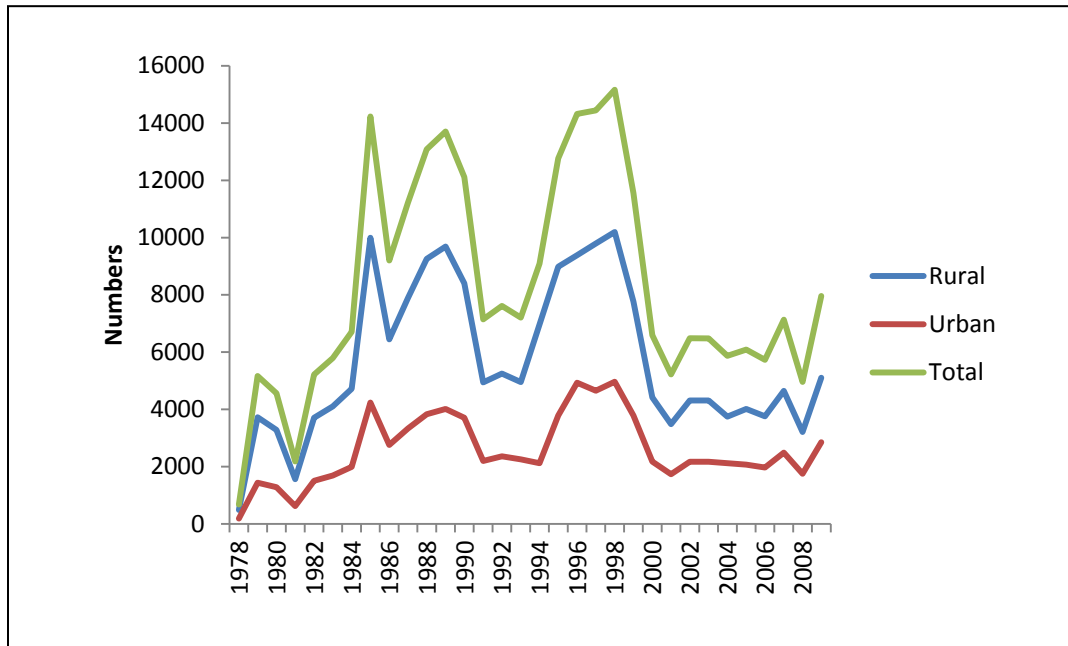
Income &Poverty Analysis

While EPI is supposed to benefit each new born child and pregnant mother across the country, however finding out the data on incremental lives due to EPI was a challenge. From the outset, it was difficult to find outcomes data on nation-wide health initiatives. We tried to inquire from the EPI offices if they had over the years tried to estimate number of lives saved due to EPI activities using perhaps more extensive methods. No such study was provided or cited by the officials. We then tried to see background data on HMIS for related information/proxies. It is established that only a proportion of improvement in mortality can be attributed to EPI (as there are other health sector interventions as well which are simultaneously in operation).

In view of the above-mentioned data gaps, we, in order to estimate the number of incremental lives saved, resorted to a much simpler method whereby we used elasticity of under-5 mortality with respect to public expenditure on EPI. This elasticity estimates were also validated through several international studies cited in the methodology section. As this estimate only represents children who were saved from death therefore we added to

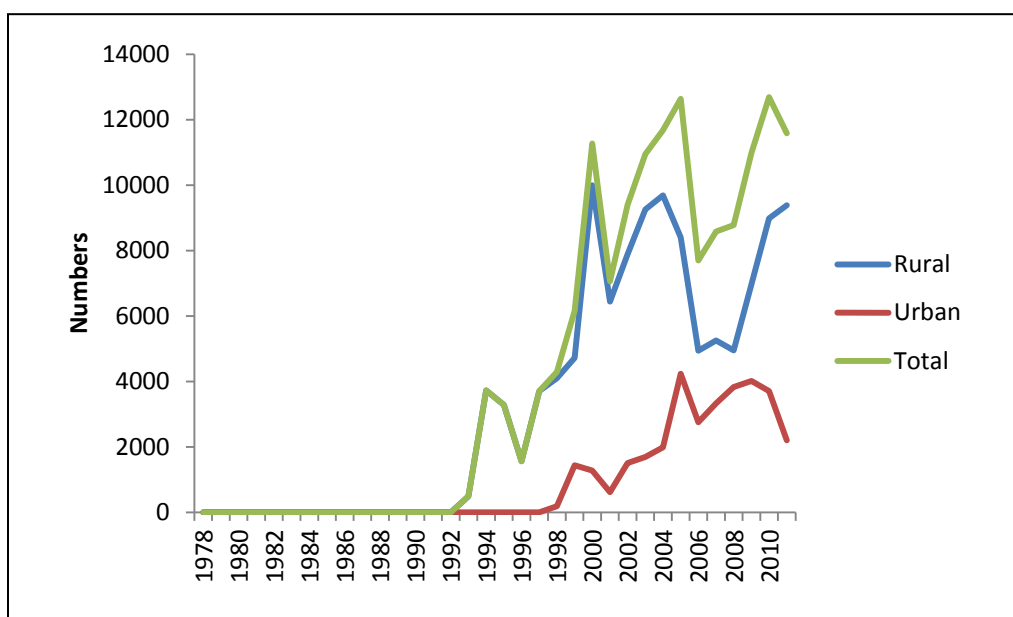
this estimate the change in annual outbreaks of polio cases reported in government statistics. Our estimated time-series is plotted in Figure 3. The total number of incremental lives added as a consequence of EPI activities is around 0.3 million. Out of which around 0.19 million belong to rural Pakistan.

Figure 1: Number of Estimated Lives Saved



As explained in our methodology section, we assume that incremental lives saved in rural areas post-1978 joined the labour market in 1993 (after 15 years on average) and urban children joined in 1998 (after 20 years on average). Our estimates show that since 1993 a total of 0.15 million incremental workers have joined the labour force owing to the EPI activities post-1978. We have plotted the time-series on this indicator as well as rural-urban split in Figure 4.

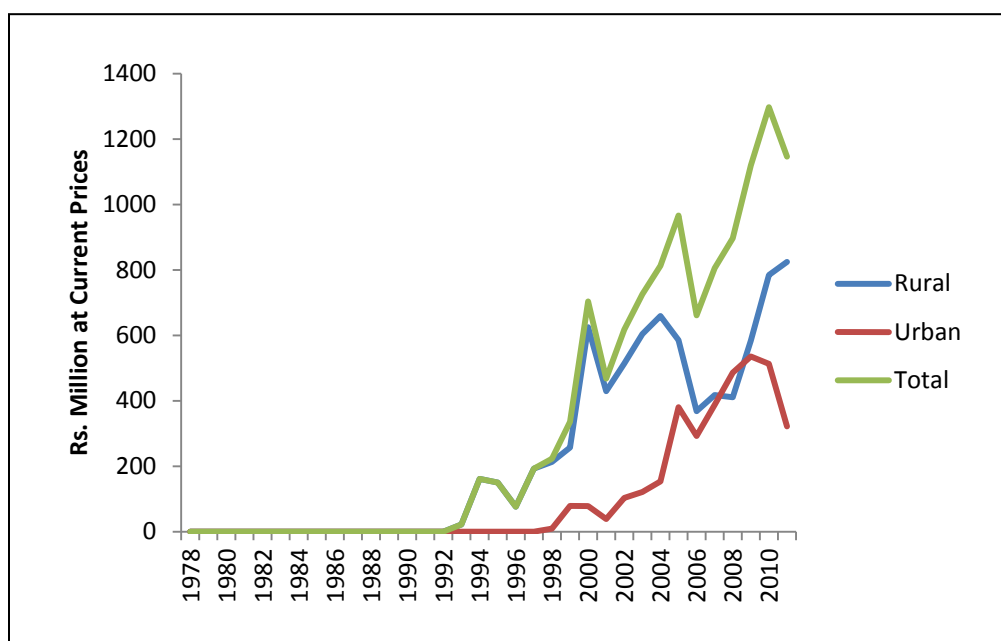
Figure 2: Number of Workers Added to Labour Force



In order to estimate the value added of these additional workers we use the annual per capita returns to farm activity for rural workers and annual per capita returns to non-farm activity for urban workers (Figure 5). Our conservative estimates reveal that the incremental lives saved under EPI activities contributed Rs 11,358 million (in 1993-94 prices) towards overall gross domestic product (GDP).

It is estimated that the increased growth contribution of additional labour force members led to 8 per centage point decline in poverty headcount on average over the decade of 2000s. As this estimate is based on growth elasticity of poverty, therefore, it is better to interpret that poverty headcount would have been 8 per centage points higher in 2000s had EPI not been in place since 1978. Through a similar working we found that Gini coefficient, a measure of inequality (in our case consumption inequality) would have been higher by 5 per centage points on average during 2000s, had EPI not been in place since 1978.

Figure 3: Addition to Gross Domestic Product at factor cost (2010-11 prices)



Conclusion and Policy Recommendations

International statistics on childhood health indicators reveal how Pakistan lags behind its future pursuit of a globally competitive labour. These figures become even more disappointing when one observes that Pakistan is amongst the only three countries in the world which has been unable to combat polio despite over 30 years of the EPI operation. Keeping this in view, this study makes two important contributions towards existing literature on health policy assessment and the Expanded Program on Immunization in Pakistan. It has carried out for the first time an impact assessment of the EPI since 1978 by using a methodology that is new to the literature on Pakistan's EPI, i.e. a Poverty and Income Impact Assessment.

The household survey, conducted as part of this study, along with several focus group discussions and key informant interviews, has updated the existing knowledge on the tasks requiring immediate attention at various administrative levels in Pakistan's health sector (and EPI in particular). At the federal level, the tasks poorly addressed include: long-range policy planning for national health goals/indicators and targets; human resource planning in health sector, ensuring minimum service delivery standards; timely releases of federal funding; variance between allocations, releases and expenditures; ambiguous procurement procedures; bridging caveats, which restrict funds flow to the provinces and hinder the planning and implementation of activities as directed by Council of Common Interest (CCI); and communication channels between national and sub-national units.

At the provincial level, the tasks awaiting attention include: improvising and contributing resources with the federal funding given the greater fiscal space in the aftermath of the 7th NFC Award; regular identification of lacunas in program implementation; regular review of supply chain management; annual review of staff motivation issues and incentives structure; data collection and management systems; region-specific capacity building of manpower; improving reporting capacities; customizing public awareness campaigns according to region-specific challenges; preparing separate operational strategy and manpower for EPI routine services and NIDs; institutionalizing M&E processes; providing M&E feedback to provincial and sub-provincial officials; integrating those vertical programs which have synergies and complementarities hence bringing in cost efficiencies and economies of scale; and exploring synergies with other provincial health sector programs and pooling resources for the better utilization of resources.

At the district or local level, there are issues related to: inadequate personnel and staff; inadequate incentives for staff; poor supervision; frequent multi-tasking (e.g. simultaneous NIDs and routine immunization); constraints on mobility of vaccines and vaccinator; political interference in recruitment; lack of local ownership of EPI activities and overcoming the cultural barriers through the involvement of local stakeholders like religious and political leaders, civil society and community based organizations in addition to NGOs. Owing to the above-mentioned issues, our household survey revealed uneven performance of EPI across Pakistan.

Our economic analysis reveals that the total number of incremental lives saved as a consequence of EPI activities is around 0.3 million out of which 0.19 million is in rural areas. Furthermore, our conservative estimate reveals that the incremental lives saved under EPI contributed Rs 11,358 million (in 1993-94 prices) towards overall gross domestic product. This growth contribution and related factors led to 8 percentage point decline in poverty headcount on average over the decade of 2000s. The Gini coefficient a measure of inequality also remained lower by 5 percentage points on average during 2000s due to EPI activities.

The infant mortality and morbidity in Pakistan continue to be on the higher side in comparison to any conventional regional or global standards. While several evaluations were conducted and recommendations placed, it is clear that due to the health sector governance challenges, particularly fragmented decision-making and poor incentives, most of the recommendations have not been implemented. The starting point towards implementing any future framework should be reform and restructuring of the health

sector accountability and administration, which is the only apparatus for the implementation of public sector and public-private partnership reforms.

While it is not in the purview of this report to recommend reforms for public and private sectors' inclusion in the administrative set-up and health sector policy, planning and implementation, the following specific measures are meant to guide the government as to how cost-effectiveness of the EPI can be increased in Pakistan. Most of these measures are derived from the policy and practice lacunas in EPI outlined through our institutional, service delivery, social and poverty impact analyses.

The report argues several policy and practice level reforms for EPI in Pakistan. First, in order to pull together the fragmented administration of EPI, the federal government needs to reorganize its operations. Currently, while the EPI office is under the executive control of Ministry of Inter-provincial Coordination and Planning and Development Division, the Inter-provincial Committee on Polio is based in Prime Minister's Secretariat. We recommend here to expand the purview of this committee to include all 8 preventable diseases that fall under EPI.

Second, there is a weak futuristic forecasting for EPI services at provincial levels. Therefore, suggestion is to establish Planning Cells in Provincial EPI offices. These cells should be tasked with revisiting area-specific indicators and targets, carry out area-specific analysis of program coverage, service availability and utilization. Furthermore, these cells should also be tasked to deliberate on program sustainability.

Third, while monitoring at local level is envisaged in the PC-I document, the monitoring, evaluation and feedback system needs to be strengthened in the provincial and sub-provincial EPI offices. The feedback system should be responsive to currently absent grievance redressal mechanism. Such a mechanism is essential to develop a pull from the demand side. Initiatives such as social accountability can also help strengthen grievance mechanism.

Fourth, greater technological augmentation is required for vaccine stock management. Currently, there is a weak reporting and accountability of expired or heat affected vaccine stock. We have recommended that centrally monitored GPS systems at provincial offices should be introduced, which should be able to see live and real time temperatures of vaccines in cold rooms and vaccine under transportation.

Fifth, there is a need to rectify the incentives structure in order to ensure a motivated staff. We have recommended performance incentives, however usual checks and balances are required in order to prevent misuse of these incentives.

Sixth, Linking of the EPI with NADRA offices has become extremely important. Currently, population records are not being validated through birth registration. While there is a need in the medium-term to make birth registration mandatory across rural and urban regions, there are ways through which the government can incentivize parents to make such registration with immediate effect as well. For this purpose, we have pointed towards Brazilian case study.

Seventh, the EPI staff faces great difficulty in providing services to people on the move. This usually happens during disaster or climate change-led migrations in Pakistan. For this purpose, we recommend linkage between the EPI and provincial disaster management authorities in Pakistan. NADRA will again have to come in the loop in order to provide migration statistics as validated by provincial disaster management authorities.

Eighth, reinforced effort is required in order to restructure and customize public awareness campaigns across the country. The strategic communications plan needs to be revised in order to take account of post-18th Amendment changes. For this purpose, synergies should also be developed with other health sector initiatives – most of which have a component on public awareness.

Ninth, we recommend a public-private sector working group on the EPI in order to discover the opportunities that may exist for private sector in Pakistan to get involved in the EPI supply chain. We have mentioned instances from India and Bangladesh where private sector is supporting the government in meeting its coverage targets. Similarly, we have also recommended that a separate national working group may deliberate on focused intervention in conflict-prone areas of Pakistan.

Finally, keeping in view the low motivation amongst the EPI staff and lack of intellectual capacity, we recommend annual mandatory trainings and opportunities for the exchange of ideas. Such venues will give them an opportunity to exchange the lessons learnt and witness home-grown best practices.

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