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CHILDHOOD IMMUNIZATION IN PAKISTAN

Introduction

Pakistan has some of the highest rates of deaths among children in the world. One child in every 11 (87 per 1000 live births) born in Pakistan dies before turning 5 years old and nearly half of all deaths in Pakistan are among children less than 5 year old, compared with 8-10% of all deaths in developed countries[1]. Although the rates of child death have been falling steadily over years, however, progress has been slow and Pakistan may miss meeting its Millennium Development Goals (MDGs) 2015 target of reducing under 5 deaths to 52/ 1000 live births[2]. Pakistan is one of the 3 countries where polio transmission remains endemic. Around a third of these child deaths are due to vaccine preventable diseases[3]. Since communicable diseases contribute so much to morbidity and mortality rates, prevention programs, particularly immunization are critical.

VACCINATION SCHEDULE

Age	Vaccinations	New schedule (2010 onwards)
At birth	BCG + Polio 0	BCG + Polio 0
6 Weeks	DPT 1 + HBV 1 + Polio 1	Pentavalent + Polio 1
10 Weeks	DPT 2 + HBV 2 + Polio 2	Pentavalent + Polio 2
14 Weeks	DPT 3 + HBV 3 + Polio 3	Pentavalent + Polio 3
9 months	Measles	Measles
12-15 months		Measles 2

Funding and Scope of the Immunization Program

In 2008 approximately USD 234 million were spent on childhood immunization and represented a substantial increase from around USD 154 million in 2005. These included USD 109 million on campaigns, USD 104 on routine immunization and USD 20 Million on shared health systems costs[4]. The Government of Pakistan's share was roughly 20% of the total funding. Immunization is mainly managed by the Expanded Programme on Immunization (EPI) with support from the GAVI Alliance, the World Health Organization (WHO), and UNICEF. All but 3% of immunization is conducted by the public sector[5]. This paper describes an outline of childhood immunization program in Pakistan.

SALIENT POINTS

- Immunization coverage surveys suggest that 1 in every 5 children is not immunized
- In many rural areas 2 of every 3 children are not immunized
- Funding for Immunization increased from USD 154 million in 2005 to USD 234 million in 2008
- More than half of all funding is spent on campaigns which are mainly directed at polio
- Coverage for some antigens such as polio in routine immunizations actually decreased while funding increased

Coverage of the Immunization Program

The estimated total coverage for a fully immunized child in Pakistan varies between 56% - 88% with considerable variation between provinces (PDHS, PSLM). The coverage also varies by the antigen, being the highest for BCG, DPT1 and HBV and the lowest for polio. In terms of coverage, Pakistan is lagging behind regional countries such as Bangladesh and Sri Lanka. India has managed to interrupt indigenous polio transmission in 2011 through aggressive high-quality polio vaccine campaigns.

More than half of the funding for immunization is for campaigns which are predominantly for polio and yet polio case numbers have been increasing since 2007 There is considerable debate about the effect this enhanced emphasis on polio campaigns is having on routine immunization activities and whether the nation and the polio eradication effort will be served better by finding a better balance between routine immunization and the 8-12 periodic campaigns annually that essentially stop routine immunization efforts for 10-12 days every month. Persisting differences between rural and urban

[1] Immunization in Pakistan. Pildat, 2010

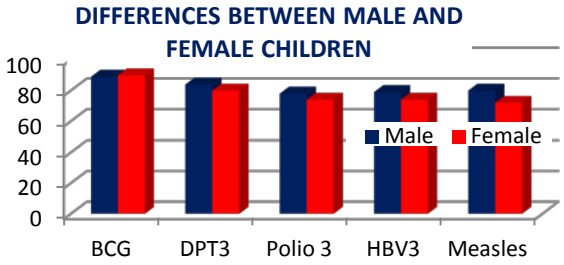
[2] UNDP, 2011

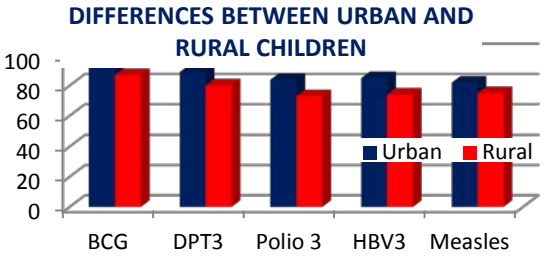
[3] UNICEF 2009

[4] Pakistan Comprehensive Multi-Year National Immunization Strategic Plan 2011-5 (cMYP)

[5] Hasan Q, Bosan AH, Bile KM. A review of EPI progress in Pakistan towards achieving coverage targets: present situation and the way forward. East Mediterr Health J 2010;16 Suppl:S31-S38.

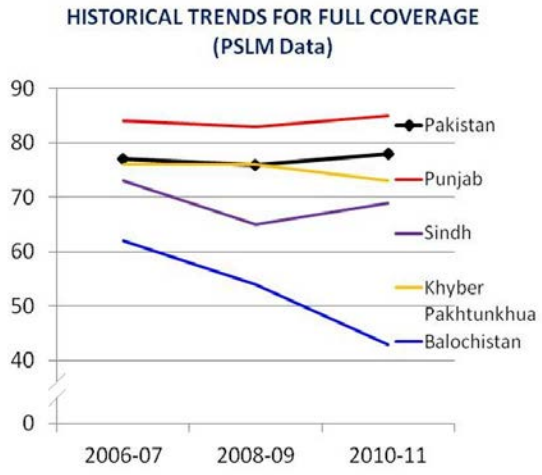
children suggest the need to increase access of the poor and the marginalized to health and preventive services. Although the differences between male and female children are lower, it is worth reflecting that no differences at birth vaccine (BCG) become considerably wider at one year (measles).



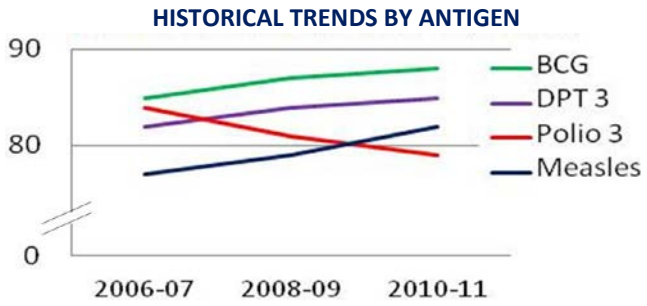


Historical Trends

The overall rate of estimated coverage for a fully immunized child has remained fairly stable between 2006 and 2011. Balochistan experienced significant reduction in immunization coverage. Despite the security situation in Khyber Pakhtunkhwa, it had higher immunization coverage than Sindh.



However coverage for different antigens varies antigens. BCG and DPT1 had the highest rates of coverage that have increased steadily. It is also noteworthy that in 2006-7, 10% fewer children received Measles than either BCG or DPT1, suggesting loss of children to follow up. However, this gap is narrowing and had reduced to around 6% in 2010-11. The most telling story is that of polio vaccine which despite all the effort shows a decreasing trend over time when routine immunization for polio vaccine is measured. The total cases of polio reported from Pakistan increased from 40 in 2005 to 198 in 2011. During this time, coverage for 3 does of routine polio vaccine fell from 84% to 78%, in addition to dropping coverage from first doses to third doses of both polio and DPT. During this time, funding for immunization increased from USD 154 million to 234 million, more than half of which goes for campaigns mainly directed at polio eradication. However, anecdotes suggest mismanagement, political interference, and corruption limit the efficacy of these campaigns in many areas.



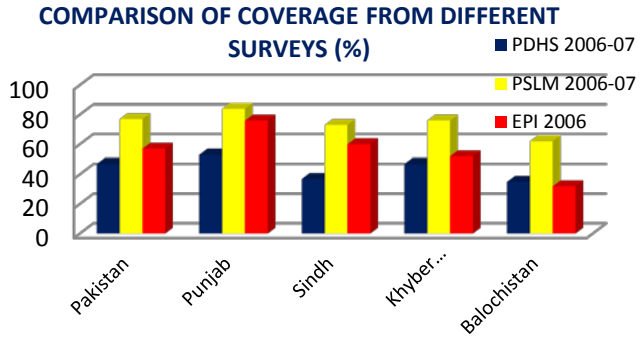
Understanding the differences between Surveys: Why are there discrepancies

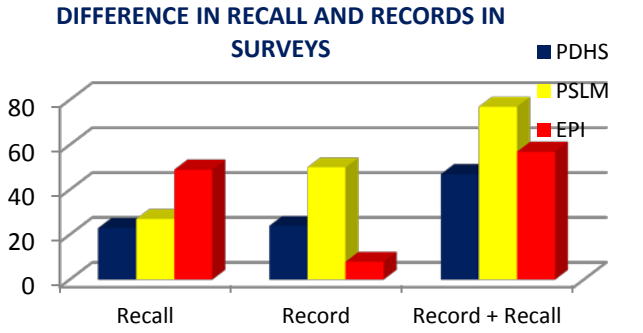
Data collected through three different sources show wide differences in coverage rates, which is the highest for the PSLM surveys and the lowest for the PDHS. All surveys use the same measure, i.e. a combination of mothers recall and a record of vaccination available with the family on the vaccination card and the same sampling frame which is provided by the Federal Bureau of Statistics. One reason for the discrepancies may be due to the manner in which interviewers pose the question in the field, suggesting that perhaps more standardized training of interviewers may be warranted.

Another possible reason may be that the measure itself, mothers' recall may be highly unreliable as was demonstrated recently for measles vaccination in Karachi. In this study, the investigators followed up a supplemental measles campaign and asked mothers if their child had received measles vaccination. The responses were corroborated against measurement of vaccine generated immunity to the measles by measuring their antibody levels against measles and controlling for reported measles among the children. It was evident that neither the mothers' claim that the child was vaccinated, nor the claim that the child did not receive the vaccine were correlated with actual status of immunity of the child. In other words, mothers' recall of vaccination was unreliable in measuring if the child had or had not received the vaccine[6]. No other study has actually measured mothers' recall against actual immunity although other studies have found good correlation between recall and health providers' records of vaccination[7,8].

[6] Shaikh S et al. Measles susceptibility in children in Karachi, Pakistan. Vaccine 29 (2011) 3419–3423

[7] Brown, J., Monasch, R., Bicego, G., Burton, A., and Boerma J. T., (2002). An Assessment of the Quality of





The other reason may be that although the sampling frame and measures were the same, the interviewers for each of the survey were trained differently and may have asked the question differently. For example in the EPI survey of 2006, very few households were found to have a record of the child's immunization. Both the PSLM and PDHS have at least twice as high a record than the EPI survey.

Conclusions

With the exception of north-central Punjab, AJK, and Gilgit-Baltistan, routine immunization coverage rates in Pakistan remain significantly below desired rates of 90% fully immunized children. This explains the widespread outbreaks of polio cases all over the country over the last 3 years. During this time, considerable efforts have been made to improve the quality of polio vaccine campaigns but not the routine immunization coverage. Coverage has worsened in some areas despite increased funding. Despite using same measures and sampling techniques, different surveys show different results in part due to the low reliability of mothers' recall as the measure for these surveys. This may be overcome with better recording and reporting of immunization by health providers/ facilities, including the use of electronic technologies for recording vaccination.

RECOMMENDATIONS

- The Routine Immunization program must be promoted with better oversight and emphasis on performance
- Electronic data recording methods must be considered for routine records of vaccination to improve service delivery, reporting, and monitoring
- Political emphasis on efficient immunization services and accountable campaigns is needed.
- Devolution of health to provinces presents a real opportunity to improve immunization by allowing local autonomy to districts to find local solutions for improving and demonstrating their performance

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[8] Murray, C.J., Shengelia B., Gupta, N., Moussavi, S., Tandon, A. and Thieren, M. (2003). Validity of *reported* vaccination coverage in 45 countries, Lancet 362: 1022–27