



Missed opportunities for vaccination in health facilities in Swaziland

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Objectives. To determine whether potential exists to increase vaccination coverage in Swaziland by reducing missed opportunities.

Design. The standard World Health Organisation Expanded Programme on Immunisation (WHO EPI) protocol for assessing missed opportunities for vaccination was used to conduct this study. It involved client exit interviews and review of health cards.

Setting. Selected variety of health facilities in Swaziland.

Subjects. Children less than 2 years of age and women of child-bearing age exiting each facility.

Outcome measures. Children and women eligible for vaccination exiting sampled health facilities.

Results. Fifty-four per cent of eligible children less than 2 years of age were missed for vaccination. This constitutes 26% of all children less than 2 years old leaving the facilities studied. Almost 100% of eligible women of childbearing age

were missed for vaccination, constituting 88% of women leaving the study facilities. The distribution of the proportion of missed opportunities varied considerably between regions and health facility types. Missed opportunities occurred more frequently among those children requiring the first dose of all antigens and this may be linked to the high proportion of children missed for vaccination who did not possess a health card. Missed opportunities were more likely to occur in facilities providing integrated services.

Conclusions. The frequent attendance at health facilities of the target group presents a valuable opportunity to increase vaccination coverage through avoidance of missed opportunities. All regions need to set vaccination coverage targets and develop plans to increase coverage, which should include strategies to ensure that all health workers routinely screen all clients for eligibility and vaccinate as required.

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In Africa, increases in routine vaccination coverage in the 1990s have not matched the gains achieved during the previous decade and strategies are required to increase coverage further. Avoiding missed opportunities by routinely screening children and women of reproductive age at every contact with a service delivery point is World Health Organisation (WHO)-recommended policy, and is a key strategy for achieving and maintaining high vaccination coverage.¹ A missed opportunity for vaccination occurs when a child or woman of childbearing age comes to a health facility or outreach site and does not receive any or all of the vaccine doses for which he or she is eligible.

Although Swaziland achieved 91% vaccination coverage of infants in 1995, routine health information data suggest that vaccination coverage decreased after 1997. This was subsequently verified by a household survey which found the immunisation coverage to be 82%.² Fully integrated services

and routine screening for eligibility for vaccination have been standard policy of the Expanded Programme on Immunisation (EPI) in Swaziland for many years, as it has been in other African countries. A compilation of previous studies has shown that missed opportunities for vaccination occur commonly in Africa and other developing countries.³ In 1997, national EPI staff in Swaziland undertook a survey of missed opportunities for vaccination to determine whether the potential existed to reverse the decline in coverage through reducing missed opportunities.

Methods

A missed opportunities questionnaire was 'piggybacked' onto a health facility study of acute respiratory infection (ARI), and many of the facilities were selected according to ARI survey criteria. The sampling frame consisted of health facilities that saw three or more ARI cases per day during July 1996. This yielded 27 facilities and all were included in the sample. An additional seven private and company facilities were randomly selected and added to the list of facilities to provide a nationally representative sample. Twenty-nine of these 34 facilities saw patients in the respective age categories of interest (see below) and were included in the missed opportunities survey.

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Data were collected at an exit interview conducted in Siswati, and from review of the children's and women's health cards. Only children less than 2 years of age and women of childbearing age were included in the sample. The data collection tool was adapted from standard WHO/EPI guidelines.⁴ Since this survey was originally planned for ARI clients, questions relating to reasons for visiting the facility were omitted. In order to expand the sample size the interviewers included clients attending the health facility for reasons other than ARI. This may have included siblings of children attending the health facility (for many years caretakers have been encouraged to bring health cards for accompanying children on such visits). It is EPI policy in Swaziland to screen accompanying children and caretakers for vaccination.

Vaccination data on each child's card were examined to determine if the child was up to date. In the absence of a card, the caretaker was questioned on vaccination history. The schedule calls for a dose of BCG and oral polio vaccine (OPV) at birth, three doses of OPV, diphtheria-pertussis-tetanus (DPT) and hepatitis B vaccine (HB) each at 6, 10 and 14 weeks, respectively, measles vaccine at 9 months, and DPT and measles boosters at 18 months of age.

Any child who was not up to date, lacked appropriate contraindications, or whose caretaker had not refused the vaccination, was considered a missed opportunity. A child was considered to fall in the category 'not up to date' as soon as she or he became eligible for vaccination. If there was no clear evidence that a child had been vaccinated (for example, no card available and no knowledge on the part of the caretaker of the child's vaccination history) then the child was considered eligible.

Vaccination data on each woman's health card were used to determine whether that woman was up to date, and verbal history was used if the card was absent. Swaziland EPI policy requires that the first dose of tetanus toxoid (TT) should be administered during the woman's first contact with the health system when she comes of childbearing age (considered to be at 15 years of age). Often the first contact occurs at the antenatal clinic. The second dose should be given ≥ 4 weeks later. The third dose should be given ≥ 6 months later, the fourth ≥ 1 year after the third, and a final fifth dose should be administered ≥ 1 year after the fourth dose. A woman was considered up to date if she had received her first dose < 4 weeks ago, her second dose < 6 months ago, or her third or fourth dose < 1 year ago. If she did not fit into any of these categories she was considered a missed opportunity. Assessment of whether a woman was up to date was done solely on the basis of TT received as an adult, and history of DPT or DT in childhood was not explored.

Interviewers were recruited from their health regions (equivalent to districts in other countries) and attended a 3-day training session where the forms were explained, role plays

were enacted, and further practice was conducted at the nearest public health unit where the data collection tool was pre-tested. Data collection took place on 10 - 17 July 1997. During this period, a small group of interviewers questioned regional health management teams and nursing school principals using a structured interview guide. Quantitative data were entered, cleaned and analysed using Epi-info version 6.03 software.

To minimise potential interviewer or respondent bias, all parties were assured that the information gathered would not be used as a basis for career promotion or for taking disciplinary measures. Codes were used for health facilities and interviewees.

Although interviewers gave feedback to facility staff on their findings before leaving each facility, and some of the causes of the problems they observed were discussed, the underlying reasons why opportunities to vaccinate were missed were not always systematically explored.

Results

Exit interviews were conducted for 177 children and 220 women of childbearing age. The largest number of respondents for child vaccination were interviewed in government clinics (41%), followed by mission clinics (12%) and non-governmental organisation (NGO) clinics and government hospitals (11% each). The remainder comprised mission hospitals (9%), private clinics (7%), government health centres (6%) and company clinics (3%). Care must be taken when drawing conclusions according to health facility type since the sample size was small for certain categories of facilities.

Thirty-nine per cent of the study children were aged 0 - 5 months and 28% were aged 6 - 11 months. Older age groups included 12 - 17 months (16%) and 18 - 23 months (17%). The age breakdown of women of childbearing age was 15 - 19 years (22%), 20 - 24 years (35%), 25 - 29 years (21%), 30 - 34 years (13%), 35 - 39 years (5%) and 40 - 44 years (4%). Ninety-six per cent of caretakers reported having a child health card, of whom 91% (87% of the total sampled) had physically brought it on the day of the visit. Only 30% of women aged 15 - 49 years reported possessing a health card, and a further 5% had their TT vaccinations recorded on their child's card. Of those children eligible for vaccination attending the facilities, 46% were vaccinated and 54% were missed opportunities. Those children who were missed constituted 26% of all children leaving the facilities. No vaccinations were denied due to contraindications or refusal by the caretaker. Interestingly, almost three-quarters of children not in possession of a card were found to be eligible for vaccination, but the opportunity to vaccinate was missed. This group made up over one-third of all the missed opportunities found.



The proportion of eligible children missed for vaccination by region ranged from 69% in Hhohho to 31% in Manzini, with Shiselweni (65%) and Lubombo (48%) in between.

The distribution of eligible children vaccinated and missed by health facility type is shown in Fig. 1. The highest proportion of missed opportunities for vaccination among eligible children occurred in NGO and private clinics and government hospitals.

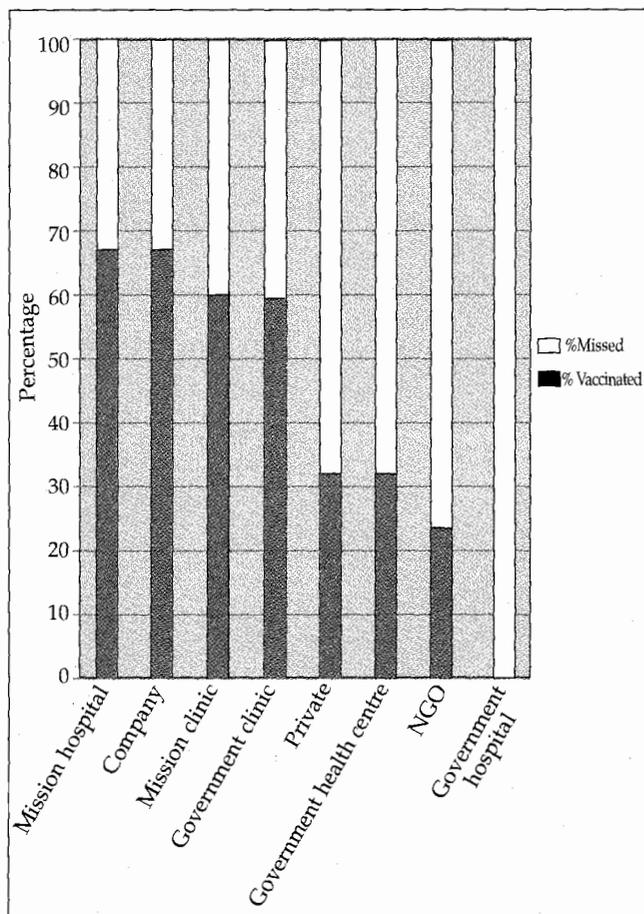


Fig. 1. Percentage of eligible children aged less than 2 years vaccinated and missed, by health facility type, Swaziland, 1997.

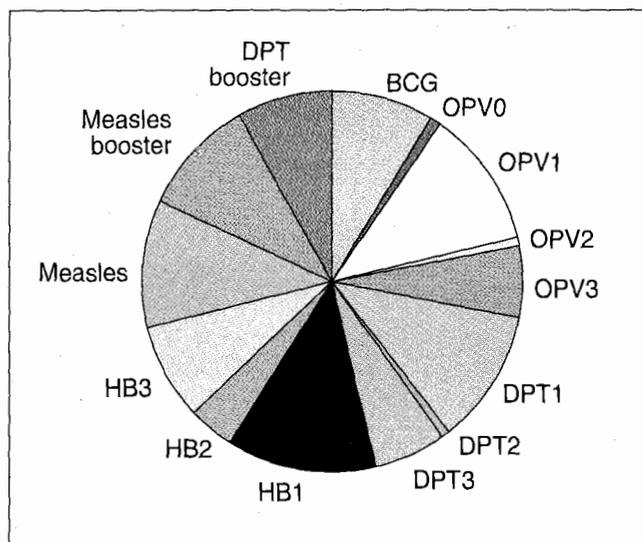


Fig. 2. Missed opportunities to vaccinate among eligible children aged less than 2 years, by antigen, Swaziland 1997.

Fig. 2 provides a breakdown of missed opportunities for vaccination among children less than 2 years of age by antigen. BCG, first dose antigens and measles booster were most frequently missed. Almost 100% of eligible women attending the facilities were missed for TT vaccination, constituting 88% of all women leaving the health facilities. This varied little across regions and categories of health facility.

The health worker in charge of each facility was asked how often vaccination services were provided. Less than half (45%) of the facilities surveyed had fully integrated their services by providing vaccination every day throughout the day. A further 7% provided daily vaccination for part of the day. The remainder vaccinated 3 days per week (14%), 1 day per week (24%), or did not provide vaccination at all (10%). Inadequate integration occurred in all types of facilities except the two NGO clinics. It also occurred in all regions. The reason usually given by the facility staff was inadequate personnel. While this was a legitimate reason in some facilities, the enumerators observed that lack of integration also occurred in adequately staffed facilities.

Table I. Association between integration of services and missed opportunities among eligible children aged less than 2 years, Swaziland, 1997

	Facilities providing vaccination daily, all day	Facilities not providing vaccination daily, all day	Total
Number of eligible children missed	30	22	52
Number of eligible children vaccinated	36	58	94
Total	66	80	146

Chi-squared = 5.08, $p < 0.05$.



Although the underlying reasons for missed opportunities for vaccination were not systematically explored, interviewers did discuss their findings with health facility staff. Their impression was that apart from the few facilities where HB was out of stock, the main reason for missed opportunities for vaccination among children under 2 years of age seemed to be the lack of integration of health services. Health workers did not check cards and vaccinate because the patient was seen on a day or at a time when vaccinations were not given. However, when tested statistically, an association between integration and missed opportunities did exist, but in the opposite direction (Table I). Facilities providing integrated services were more likely to miss the opportunity to vaccinate eligible children ($\chi^2 = 5.08, p < 0.05$).

The principal reason for missing the opportunity to administer TT to women of childbearing age was lack of awareness among health workers and the women themselves that they were eligible for TT outside pregnancy.

Discussion

A review of studies of missed opportunities for vaccination in developing countries⁵ revealed a median proportion of missed opportunities for vaccination among children of 41%. In the present study, our finding for Swaziland of 26% would seem a more favourable result. However, the large proportion of eligible children for whom the opportunity to vaccinate was missed indicates that the proportion of missed opportunities for vaccination is unacceptably high. The comparatively lower figure for Swaziland is likely to be more a result of a higher vaccination coverage. A more recent study in an urban area in Zimbabwe,⁶ a country with a similar vaccination coverage, found that only 6% of eligible children were missed for vaccination.

The findings of the present study indicate that children without a health card are more likely to be missed. However, confounding factors may influence this. For example, the study included children who may have been accompanying a sibling or caretaker rather than seeking care and may have been less likely to be screened, even though it is Swaziland EPI policy to do so. Alternatively, the absence of a card may be associated with reduced contact with the health system and more children in this category may be eligible. The link between missed opportunity and absence of a child health card may also explain the unusual distribution of missed opportunities by antigen. The higher number of first doses required among eligible children probably reflects the absence of a vaccination history during the consultation with the health worker. Without this the child would be recorded as eligible for the first dose of each respective antigen, according to the vaccination schedule.

Children eligible for vaccination were more likely to be

missed in Shiselweni and Hhohho regions, and in certain categories of health facilities, but there is room for improvement in all regions and all types of facilities.

While those facilities following the policy of integration of services are to be commended, greater adherence to vaccination policy should be implemented in other facilities. Of great concern is the high proportion of facilities (24%) providing vaccination only once per week. This contradicts promises made to the public through the media and community-based health workers. Results indicate that non-integration occurs in almost all categories of health facility.

While we expected that facilities providing integrated services would experience fewer missed opportunities, surprisingly the data indicated the opposite. NGO clinics were an example of this anomaly. Both NGO clinics reported providing integrated services, yet 76% of eligible children were missed for vaccination. One likely reason is that integrated facilities provide vaccination at all times on demand, but do not routinely screen when a child presents for curative services or accompanies a client.

The large proportion of missed opportunities for TT vaccination indicates that TT coverage of women of childbearing age could be greatly improved by taking advantage of every contact with the health service. By far the major cause of missed opportunities for vaccination among women of childbearing age was lack of knowledge among both health workers and the women themselves that they were eligible. If health workers do not request health cards, then women will not be encouraged to bring them, and screening will remain problematic. That some TT doses were recorded on the child's card suggests that there may also be a shortage of health cards for women. The potential to increase routine vaccination coverage among young children and women of childbearing age is considerable if all beneficiaries are systematically screened and vaccinated at every opportunity. Utilisation of health facilities by women and children is high. A household study among children under 7 years in Swaziland found that 89% of children had been taken to a health facility for treatment at least once in the previous 12 months.⁷ In 1995, there were 276 282 outpatient cases under 5 years of age with either respiratory or diarrhoeal diseases,⁸ which is equivalent in number to approximately 7 birth cohorts. Furthermore, the vast majority of these health service contacts are accompanied by women of childbearing age, and are in addition to women's contacts that occur when seeking curative services or family planning.

Recommendations

1. Regional health management teams should be provided with the latest estimate, or assisted to calculate an estimate, of routine vaccination coverage in their region and develop a plan



with measurable targets to raise vaccination coverage, including strategies to minimise missed opportunities. It is recommended that this plan includes, among other things: (i) ensuring that all health workers screen health cards of children and women of childbearing age routinely; (ii) ensuring that all facilities offer vaccination services during all working hours; (iii) ensuring that staff vaccinate even if only one woman or child is eligible for vaccination, regardless of wastage; and (iv) ensuring that all service delivery points have adequate vaccines, including buffer stocks.

2. Women should be made aware of the full TT schedule so that they are empowered to demand such a service. They should also be encouraged to carry TT vaccination cards when visiting a service delivery point. Routine TT vaccination should be fully integrated into family planning and antenatal services.

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