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# Missed opportunities for immunisation at hospitals in the western Cape — a reappraisal

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**Abstract** Immunisation practices were examined at 6 hospitals in the western Cape during the latter half of 1992 to determine whether these practices had improved subsequent to the February 1991 resolution of the Health Matters Committee (HMC) on immunisation in hospitals, and since a similar study was undertaken in 1990. Exit interviews were conducted with the escorts of all children aged 3 - 59 months who attended the study hospitals on the days designated for the study.

In the second study, 88 of the 311 children studied (28,3%) were in need of immunisation on arrival, but only 12 of the 88 (13,6%) were immunised during the hospital visit. There was no evidence of an increase in requests to see children's Road-to-Health cards (37,1% compared with 35,2% previously). The

incidence of missed opportunities for measles immunisation in children aged 6 - 59 months remained unacceptably high (51,4% compared with 63,7% previously, when a strict definition was used; and 15,7% compared with 18,1% previously, when a lenient definition was used).

Health authorities at all levels need to take urgent action to address the problem of missed opportunities for immunisation at hospitals.

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Vaccine-preventable childhood infectious diseases such as measles and whooping cough are still endemic despite the availability of free immunisation at community clinics. During the latter part of 1992 the incidence of measles increased in several parts of South Africa, including the western Cape.

Despite a nationwide measles vaccine campaign in 1990, measles vaccine coverage in the Cape Province remains low,<sup>1</sup> and is inadequate for effective herd immunity.<sup>2</sup> Coverage with the other schedule Expanded Programme on Immunization vaccines<sup>1</sup> remains well below the desirable 100%.

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The World Health Organisation's Expanded Programme on Immunization advocates that immunisations be checked at children's every contact with health services, whether the attendance is for preventive or curative care; children found to be in need of immunisation should be immunised.<sup>3</sup> An American study identified failure of the vaccine delivery system as the most important cause of poor vaccine coverage.<sup>4</sup> Studies undertaken locally<sup>5</sup> and elsewhere<sup>6</sup> have found that missed opportunities for immunisation during contacts with health services contribute substantially to suboptimal vaccine coverage in the community. However, many hospitals in South Africa, including 3 of the 6 facilities considered in this study, do not provide immunisation. Therefore many opportunities to immunise children, and thereby improve vaccine coverage in the community, are missed.

In February 1990, just before the national measles immunisation campaign, a study<sup>7</sup> was carried out at 8 hospitals in the western Cape to determine the extent of missed opportunities for measles immunisation in children aged 6 months to 5 years attending such facilities. The study demonstrated that children were not having their immunisation status checked routinely during hospital visits, and that missed opportunities for immunisation were common at all facilities studied.<sup>7</sup>

One year later, in February 1991, the Health Matters Committee (HMC) of the Department of National Health and Population Development issued a resolution on immunisation in hospitals (Item 2.5, 21 February 1991) to address the problem of missed opportunities for immunisation. This resolution advocated that all academic, regional, and community hospitals should: (i) ascertain the immunisation status of all children between the ages of 6 months and 5 years who attended the hospitals; (ii) devise an immunisation strategy in order to render the necessary immunisation service; (iii) immunise children against diphtheria, pertussis, tetanus, tuberculosis, measles, and polio; (iv) record immunisations on the child's Road-to-Health (RTH) card.

In view of this resolution a repeat study was conducted at 6 of the hospitals where immunisation practices had been studied previously. The repeat study took place 2½ years after the initial study and 1½ years after the HMC resolution, during the period July to October 1992. The purpose of the repeat study was to determine whether immunisation practices had improved in these facilities subsequent to the HMC resolution, and whether the incidence of missed opportunities for measles immunisation had declined.

## Methods

The facilities where the study was repeated included a large academic hospital serving much of the Cape Town region, 4 community hospitals (day hospitals), 2 located in black townships and 2 in coloured communities, and a regional hospital in a country town 115 km from Cape Town. Two facilities included in the first study were excluded from the second study, 1 for logistic reasons (multiple exit points), and 1 because of a small sample size. The 6 facilities selected for the repeat study were under the control of four different health authorities.

Each child's escort was interviewed on departure from the facility. All children who met the age criteria were included, except in cases where the adult escorting the child refused to participate. The first study included children aged 6 - 59 months, while the second study included children aged 3 - 59 months. (This was because the first study focused specifically on measles immunisation, while the second study had a broader focus on immunisation practices.) In the first study some interviews were conducted after hours. In the second study all interviews were conducted during office hours on one weekday at each facility.

Immunisation details were obtained from the child's RTH card if available, or else by questioning the child's

escort. Children found to be in need of immunisation were referred to their local clinic.

In comparing the results of the two studies, data on children aged less than 6 months (from study 2), data collected after hours (from study 1) and data from the 2 hospitals where the study was not repeated, were excluded from the analysis for purposes of comparability. (For this reason the first study sample sizes are smaller, and the results of the first study noted here differ slightly from those published previously.<sup>7</sup>)

Children in need of immunisation who were not immunised during the hospital visit (including children referred elsewhere for immunisation) were defined as having missed an opportunity for immunisation. The official schedule of immunisations was used to determine which immunisations each child should have received, depending on age. All children aged 6 months or more who had not been immunised against measles were considered to have missed an opportunity for measles immunisation. The policy within the region is to immunise 'high-risk' children at 6 months and 'low-risk' children at 9 months. All children in the 2 studies were at 'high risk' in view of the risk of contracting measles infection during the hospital visit.<sup>5,6</sup>

Strict and lenient definitions of missed opportunities for immunisation were used. The lenient definition considered children without documentation of immunisation, but whose escorts reported them to be up to date with their immunisations, to be fully immunised for age. The strict definition relied on documented (RTH card) information as evidence of immunisation, and all children without documentation, who had not been immunised during the hospital visit, were therefore considered to have missed an opportunity for immunisation.

## Results

Despite the HMC resolution, there had not been any changes in immunisation policy at any of the individual facilities in the period between the first and second studies. The academic hospital and 2 of the day hospitals had immunisation available on site and a policy of immunising children aged 6 months or more against measles if they had not been immunised previously. The other 3 facilities did not provide routine immunisation at the time of the second study.

The sample size for the first study was 471 after the exclusion of data collected after hours and data from the two facilities where the study was not repeated. There were 311 children in the second study. Of the 311, 286 were aged 6 months or more and were used for comparison with the first study. In the second study only 6 children meeting the age criteria attended the rural hospital on the day of the study. In view of the small sample size the results for this hospital are not given in the facility-specific results in Table II but are included in the pooled results for all 6 facilities.

In the second study, 88 (28,3%) of the 311 children were in need of immunisation on arrival at the hospital. Of the 311 children, 17,1% needed measles immunisation and 22,5% needed one or more of the other scheduled immunisations. Children in need of immunisation were found throughout the age range studied.

At all facilities, including the 3 facilities where vaccine was available on site, the majority of children in need of immunisation were neither immunised nor referred for immunisation (Table I). Only 12 of the 88 children needing immunisation (13,6%) were immunised during the hospital visit. An additional 13 children attending the facilities where immunisation was available on site were referred to their local community clinic for immunisation, but were not immunised during the hospital visit.

The proportion of children whose RTH cards were requested and the proportion of children whose cards were available remained low at all facilities (Table II). Although there was a marked increase in requests to see children's RTH cards at 2 of the day hospitals, the pooled results for

**TABLE I.**  
**Action taken in children aged 3 to 59 months reported or documented to be in need of immunisation during the second study**

	Attendees needing immunisation*		Action taken		
	No.	%	No action	Immunised during visit	Referred to clinic
Facilities which did not offer immunisation					
Day hospital 1	15	28,9	ND	0	ND
Day hospital 2	4	11,8	4	0	0
Rural hospital	2	33,3	2	0	0
Facilities with immunisation available on site					
Day hospitals 3 and 4	11	30,6	5	4	2
Academic hospital	56	30,6	37	8	11
<b>Total</b>	<b>88</b>	<b>28,3</b>	<b>48 - 63†</b>	<b>12 13,6%</b>	<b>13 - 28†</b>

\* This is a conservative estimate based on RTH card documentation of incomplete immunisation for age, or a report from the child's escort that the child was not up to date with immunisations.  
† Total indeterminate as it was not recorded whether any of the 15 children in need of immunisation at Day hospital 1 were referred.  
ND = not determined.

**TABLE II.**  
**Changes in the proportion of children aged 6 to 59 months whose RTH cards were requested/available, and who missed an opportunity for measles immunisation during the hospital visit**

Variable	Study 1 (% of attendees)	Study 2 (% of attendees)	Difference (Study 2 - Study 1)	95% confidence interval of the difference
Child's RTH card requested by a nurse or doctor				
All 6 facilities	35,2	37,1	1,8	(-5,2 - 8,9)
Day hospitals 1 and 2*	26,8	13,4	-13,4	(-25,5 - 1,3)
Day hospitals 3 and 4	36,1	65,6	29,6	(10,9 - 48,2)
Tertiary hospital	40,9	44,0	3,1	(-6,5 - 12,7)
Child's RTH card available				
All 6 facilities	38,6	51,8	13,1	(5,8 - 20,4)
Day hospitals 1 and 2	34,2	35,4	1,2	(-13,4 - 15,8)
Day hospitals 3 and 4	32,0	50,0	18,0	(-1,2 - 37,2)
Tertiary hospital	45,8	61,5	15,6	(6,1 - 25,2)
Missed opportunity for measles immunisation (strict definition)				
All 6 facilities	63,7	51,4	-12,3	(-19,5 - -5,1)
Day hospitals 1 and 2	69,5	69,5	0	(-14,1 - 14,1)
Day hospitals 3 and 4	70,1	43,8	-26,3	(-45,4 - 7,3)
Tertiary hospital	56,4	42,2	-14,3	(-23,9 - 4,7)
Missed opportunity for measles immunisation (lenient definition)				
All 6 facilities	18,1	15,7	-2,3	(-7,8 - 3,1)
Day hospitals 1 and 2	9,8	15,9	6,1	(-4,1 - 16,3)
Day hospitals 3 and 4	19,6	6,3	-13,3	(-24,7 - -2,0)
Tertiary hospital	17,4	16,9	-0,6	(-7,9 - 6,8)

\* Day hospitals 1 and 2 did not offer immunisation, while day hospitals 3 and 4, under the management of a different health authority, had immunisation available on site.

the 6 hospitals showed no overall improvement with regard to the proportion of children whose cards were requested during the visit. Overall there was a slight improvement in the proportion of children with RTH cards available. However, many children with RTH cards available did not have their cards requested during the visit.

The overall incidence of missed opportunities for measles immunisation was relatively unchanged, or at best may have decreased slightly (depending on the definition used), but remained substantial at all facilities studied (Table II).

### Discussion

Despite the HMC resolution on immunisation in hospitals, this policy has not been implemented by the four health authorities responsible for the hospitals in this study. Nor has there been any substantial improvement in immunisation practices at the study hospitals in the 2½ years since the initial study.

A substantial proportion of children attending these

hospitals needs immunisation, and most of these children still do not receive the immunisations they need when they attend these facilities. Children are not having their immunisation status checked routinely, and most children in need of immunisation are therefore not detected by hospital staff. Of the minority of children whose immunisation needs are detected by hospital staff, a substantial proportion (52% in this study) is referred to clinics for immunisation and not immunised during the hospital visit, even when immunisation is available on site. The incidence of missed opportunities for immunisation remains disquietingly high in these hospitals and reflects poor preventive health care practices.

The problem of missed opportunities for immunisation in curative health facilities is not confined to the study facilities or to the health authorities considered in this study. Studies in KwaZulu<sup>5</sup> (conducted in July - August 1989) and Natal<sup>6</sup> (conducted in October - November 1991) have shown that missed opportunities are common in these areas, and although published data for other parts of the country are lacking, it is likely that missed opportunities for immunisation are common in hospitals throughout South

Africa. Immunisation coverage in the community is unlikely to improve substantially unless the problem of missed opportunities for immunisation in hospitals is addressed, as the high proportion of children in this study who needed immunisation indicates that many children are not immunised on schedule at community clinics.

Studies done locally<sup>9</sup> and elsewhere<sup>10</sup> have shown that unimmunised children risk contracting measles infection during hospital visits. In the Cape Town area it is clinic policy to immunise black children at 6 months and all other children (who are considered to have a low risk of contracting measles) at 9 months. Many children in the 6-9-month age range visiting hospitals have thus not been immunised against measles previously and are susceptible to measles infection during the hospital visit. It is policy at some local hospitals<sup>11</sup> to immunise all children aged 6 months or more against measles during the hospital visit if they have not been immunised previously. However this policy has not been implemented at many hospitals in the western Cape, including 3 facilities in this study, and the results for the other 3 facilities where this policy is in place show that compliance with it is poor. At the time of the second study Cape Town was in the early phase of a measles epidemic, primarily affecting coloured and white children; the potential for hospital-acquired measles infection is thus a real, rather than a purely academic, concern.

The high incidence of missed opportunities for immunisation illustrates the more general problem of separate preventive and curative health services. People attending hospital are often not given comprehensive health care in which their preventive health needs are considered in addition to the problem prompting the visit. In another recent study of missed opportunities for immunisation, in which two primary health care facilities in the western Cape (not included in this study) were compared, Harrison *et al.*<sup>12</sup> showed that children attending a facility where curative and preventive health care had been integrated had a three- to fourfold lower incidence of missed opportunities for immunisation than those attending a facility in a comparable community where these functions were carried out separately in the same building, despite the availability of immunisation at both sites.

In the absence of documented information of immunisation in all subjects it is not possible to get an accurate estimate of the true incidence of missed opportunities for immunisation that occurred in the children studied. A comparison of reported immunisation status with RTH card-documented vaccine status in 134 children in the second study, in whom both reported and documented immunisation status were recorded, showed that in 8,2% reported measles immunisation status, and in 23,9% reported information on 'up-to-dateness' with other immunisations, differed from those recorded on the card. The majority of errors were reports that the child had received immunisations of which there was no documentary evidence. Reliance on reported immunisation status in children in whom documented evidence of immunisation is unavailable (corresponding to the lenient definition of missed opportunities for immunisation used in this study) may therefore seriously underestimate the true incidence of opportunities missed. Conversely, since some children without available RTH cards are likely to be up to date with scheduled immunisations, the strict definition of missed opportunities overestimates the incidence of missed opportunities for immunisation.

### Recommendations

Urgent action is needed to address the problem of missed opportunities for immunisation in hospitals. Steps need to be taken to ensure that the policy outlined in the HMC resolution on immunisation in hospitals is adopted and implemented at all levels of the health services.

This needs a commitment at the highest level of the provision of a comprehensive immunisation service. This

commitment should not only be voiced in the form of policy directives, but should also include active practical support of health service managers to enable them to carry out these directives. Practical issues that need to be addressed include the provision of suitable fridges for vaccine storage, trained staff to provide the service, and the supply of vaccines to hospitals. Funds for this purpose need to be allocated accordingly.

Fora need to be created to ensure that problems in providing an immunisation service are voiced and systematically tackled in order to ensure co-ordination between different health authorities. Issues that need to be addressed include the standardisation of the RTH card and immunisation policy across different health authorities and regions, as well as the development of surveillance procedures to monitor vaccine administration.

The purpose of surveillance would be to ensure that children in need of immunisation are identified and immunised at every contact with the health services. This could include monthly reports by each health facility of the number of doses of vaccine administered. In the event of outbreaks of vaccine-preventable disease, local vaccine coverage and the adequacy of local immunisation services should be investigated. If these are found to be suboptimal, measures should be taken to remedy the situation.

There is general agreement that the health services in South Africa are in need of major restructuring. The restructuring process should include the establishment of primary health care centres to provide both preventive and curative health care under one roof, under the management of the same regional health authority. This would be more efficient than the fragmented system currently operational and would mean that health care workers are less likely to abdicate their responsibility for attending to preventive health care needs (such as immunisation) when children present for curative care.

In areas where measles is endemic and where the disease occurs in infants, the policy should be to immunise all children aged 6 months or more who do not have documented evidence of measles immunisation during their hospital visit, in view of the risk of nosocomial transmission and the high rate of morbidity associated with measles in infancy.

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