

## Immunization in urban areas: issues and strategies\*

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*In the past, immunization programmes have focused primarily on rural areas. However, with the recognition of the increasing numbers of urban poor, it is timely to review urban immunization activities. This update addresses two questions: Is there any need to be concerned about urban immunization and, if so, is more of the same kind of rural EPI activity needed or are there specific urban issues that need specific urban strategies?*

*Vaccine-preventable diseases have specific urban patterns that require efficacious vaccines for younger children, higher target coverage levels, and particular focus to ensure national and global eradication of poliomyelitis. Although aggregate coverage levels are higher in urban than rural areas, gaps are masked since capital cities are better covered than other urban areas and the coverage in the poorest slum and periurban areas within cities is as bad as or worse than that in rural areas. Difficult access to immunization services in terms of distance, costs, and time can still be the main barrier in some parts of the city. Mobilization and motivation strategies in urban areas should make use of the mass media and workplace networks as well as the traditional word-of-mouth strategies. Use of community health workers has been successful in some urban settings. Management issues concern integration of the needs of the poor into a coherent city health plan, coordination of different health providers, and clear lines of responsibility for addressing the needs of new, urbanizing areas.*

### Introduction

#### *Issues and strategies for urban EPI*

In response to the increasing numbers of poor in the cities of low-income countries, we have collated WHO Expanded Programme on Immunization (EPI) data in order to review urban immunization and whether the issues involved demand specific urban strategies.

In the past, EPI has directed its efforts principally to rural areas, while urban immunization activities have been delivered through a mainly passive strat-

egy, dependent on user demand and uptake (1). Although this strategy has resulted in equal or better coverage rates in most urban centres compared with rural, aggregate data on urban disease incidence and immunization coverage give a misleading impression. The urban population is highly differentiated, and pockets of poor coverage and high incidence of vaccine-preventable diseases exist. The capital city may have different features compared with other urban centres, which have been little explored. In urban areas vaccine-preventable diseases have higher potential transmission rates than in rural areas, and cases have a lower age and may serve as reservoirs of disease for the general population. The population groups most often under-immunized are those in slum areas, illegal squatter settlements, and newly expanding periurban zones. These areas are also densely populated, are environmentally poor, and have few public services, including health care. Thus, these pockets of population are both underprotected against vaccine-preventable disease and overexposed to risk, making them a high-priority target group for EPI.

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Strategies developed in rural areas can be applied to the urban setting, but five specific urban issues also need to be considered when developing an urban immunization programme. First, the urban population is constantly increasing, which leads to an intensifying demand on existing health services in established slum areas and a need for new services in the expanding periurban zones. Second, public health services in urban areas are managed by a number of different bodies, e.g., the Ministry of Health or the local municipal health department. Urban areas also offer private health services, both not-for-profit non-governmental organizations (NGOs) and for-profit companies and private practitioners. Primary care services are also available at different levels in the system from primary health care posts to hospital outpatient departments. All of these providers can potentially deliver immunization services and should be coordinated to avoid duplication of effort and to maintain quality. Third, the city presents a huge array of health problems for planners of health care, and provision of basic health care, including immunization, for those at risk may be of low priority to planners. Fourth, even when immunization is on the urban health agenda, EPI managers need to define specific activities for disease control in urban areas. Finally, the potential users of urban immunization services may be more socially heterogeneous than rural populations and will require both different and a greater variety of motivational strategies.

The key issues and possible strategies for action identified are summarized in Table 1.

### **Immunization in urban areas**

This article attempts to answer the following key questions:

- Is there any need to be concerned about urban immunization?
- Is more of the same kind of EPI activity needed or are there specific urban issues that need specific urban strategies?

The first of these questions was broken down into two parts:

- Are there different patterns of vaccine-preventable diseases in urban areas?
- Are there specific problems of coverage in urban areas?

It was then addressed by collating information on disease incidence and patterns (outcome) and immunization coverage and missed opportunities (output). Outcome and output data have been analysed, where available for comparison of rural and urban areas, the capital and other urban centres, and areas within any one city.

**Table 1: Urban EPI: issues and strategies for action**

Issue	Action
<i>Population growth</i>	
Intensive	Strengthening existing services through training, quality, and organization
Expanding	EPI lead in starting basic health care provision in newly urbanized areas through outreach and campaigns  Integrate EPI with child health services such as the control of diarrhoeal and acute respiratory diseases
<i>Range of providers</i>	
Municipality/Ministry of Health	Bring together to define roles and responsibilities
Private/NGOs <sup>a</sup>	Contact professional associations Arrange training workshops Trade vaccines and cold chain for information
<i>Range of health problems</i>	
Integration of the poor as a priority into urban health planning	Determine rural-urban, inter-urban, intra-urban information needs for defining and setting priorities in health  Support capacity for decentralized planning of needs and solutions
Immunization integrated into health priorities	Develop methods for rapid and cheap local information collection and analysis  Identify and collect information for advocacy  Lobby political leaders about problems facing urban immunization  Define priority activities for immunization
<i>Disease control</i>	
Coverage targets	Set higher urban coverage targets, e.g., DPT/OPV and measles, 85–90%; poliomyelitis, and TT2, 100% <sup>b</sup>
Information needs	Establish routine and rapid methods for surveillance
Poliomyelitis eradication	Explore how major poliomyelitis actions could be used to help other EPI activities, e.g., surveillance, line listing of cases
<i>Urban users</i>	
Perspectives	Definition of priorities in health service provision for consumer
Mobilization/motivation	Use of mass media to promote immunization  Active follow-up through community health workers

<sup>a</sup> NGOs = nongovernmental organizations.

<sup>b</sup> DPT/OPV = diphtheria-pertussis-tetanus/oral polio vaccine; TT = tetanus toxoid.

The second of the above questions was, in turn, broken down into three parts:

- Why are some sectors of the urban population not immunized?
- What are the sources of immunization in urban areas?
- Are there management issues specific to urban areas?

It was addressed by collating information on processes and management of immunization delivery.

## Outcomes

### *EPI diseases in urban areas*

Are there different patterns of diseases in urban areas?

**Urban-rural differences.** Comparisons of urban and rural disease incidence indicate a particular urban risk only for measles. In five comparisons of the incidences of urban and rural measles, the capital city had one of the highest, whether given as the absolute number or the incidence rate (Côte d'Ivoire, 1990; Madagascar, 1990; Niger, 1988-91; Sri Lanka, 1990; and Tunisia, 1992). Five comparisons for poliomyelitis (EPI country files (Madagascar, 1990; China, 1991) together with one review of hospital cases in Madras, India, over 18 months (ref. 24); a poliomyelitis and lameness survey in the Islamic Republic of Iran (ref. 25); and a detailed study of cases during an outbreak in the Gambia (ref. 26)) showed no pattern, although data for the last poliomyelitis outbreaks in Latin America indicate that poor urban areas were the final reservoirs of the disease (WHO/EPI data). Data from seven countries on neonatal tetanus only included one case (in Antananarivo, Madagascar), where the incidence was higher in the urban area, which also had the lowest coverage for tetanus toxoid (Algeria, 1991; Côte d'Ivoire, 1990; Tunisia, 1990 (ref. 29); Niger, 1988-91; Syrian Arab Republic, 1988; and Islamic Republic of Iran, 1987 (ref. 30), 1990, versus Madagascar, 1990). The higher rural incidence of neonatal tetanus is associated with unattended and home deliveries, which are typically lower in urban areas (2).

**Intra-urban differentials.** Marked intra-urban differentials are found in disease incidence, similar to documented intra-urban differentials in infant mortality rates (3). Variation in risk and immunization coverage within the city indicates that vaccine-preventable diseases are still an important source of mortality and morbidity in poorer segments of the population. For example, in a periurban area of South Africa, where immunization coverage for mea-

sles was as good as in urban areas, a significantly higher percentage of children had a history of measles than either the urban or rural children (4), while in a measles outbreak in Kampala, most cases were located in just two areas of the city (5).

A recent outbreak of poliomyelitis in China, despite high coverage rates, demonstrated that certain areas were missed not only by immunization, but also by evaluation methods. The incidence of poliomyelitis cases in Ibadan, Nigeria, over a 15-year period was much higher in the centre of the city, where sanitation was poor, than in the periphery, where environmental sanitation was better (6). In Bombay, the incidence of poliomyelitis in the city in 1988 was 6 per 100 000, compared with 11 per 100 000 in the slums.

Although neonatal tetanus is associated more with rural areas, pockets of urban cases do exist. Cases in Libreville, Gabon, were from a settlement on the edge of the city of illegal immigrants, who were unwilling to register at official health services. Cases in Kinshasa were from two geographical regions: a new district on the outskirts of the city that had no health services, from where recent arrivals did not come into the city centre; and an industrialized area, where free health facilities were provided by employers, including antenatal care but not including tetanus toxoid immunization (WHO/EPI data).

### *Urban environment*

Urban sanitation and proximity to other people clearly affect the transmission of disease. In urban areas measles produces a higher percentage of younger cases with associated higher mortality compared with the situation in rural areas, indicating a need for an effective vaccine for younger children (7-11). In urban Nigeria, the age of cases of poliomyelitis was older in better-off areas (6). Similarly, in Bombay, immunization resulted in an age shift of cases to older children (12). This arises because of intensity of exposure in crowded urban settings, which was demonstrated by a positive association between population density and the proportion of cases of measles aged under 8 months (9).

Immunization programmes in urban areas exert significant effects on mortality not only by limiting the number of cases but also by decreasing the clustering of cases within households and the severity of disease (P. Aaby et al., unpublished results, 1984, and (12-14)). The age-incidence of cases in immunized populations has two peaks — one at under 2 years and the other at 5-7 years (11). The peak at 5-7 years of age indicates a need to immunize older children previously missed to avoid a build up of

susceptibles, which can lead to a potentially explosive spread of disease. Although urban immunization programmes have been initiated, and coverage levels of >50–60% have been achieved, even at 85% coverage measles has remained a major cause of urban child mortality (8, 10, 15–17). The critical age period for measles immunization when protection from maternal antibodies declines and children become susceptible is narrow in urban areas (WHO/EPI data) and the decreased age of infection in urban areas means that even 100% coverage of under-12-month-olds will not result in elimination of the disease (18). Thus, a much higher coverage rate is needed in urban than rural areas to achieve comparable reductions in incidence.

The sources of infection demonstrate, not surprisingly, the importance of household contacts for younger children aged 6–23 months, and contacts with neighbourhood children and the health centre for older children (14). The health centre as a source of infection highlights the need to convince health workers that immunizing sick children does not have unacceptable side-effects and should be performed (17, 19). Seasonal climatic factors are reflected in urban patterns of disease, although this may be reduced by increased immunization coverage, and demonstrates the potential effectiveness of extra effort directed to immunization coverage at the time of year when the number of cases is low (20). Similar, seasonal effects have also been observed for poliomyelitis incidence (12). Seasonal patterns in measles incidence were related in Yaoundé, Cameroon, not only to climate but also to seasonal migration in and out of the capital (15).

No information could be identified in which the capital was compared with other urban centres. The capital city may have the advantages of better immunization coverage and better curative health services but has the disadvantages of having the largest and densest population and thus the highest potential rate of transmission.

## Output: coverage in urban areas

Are there problems of coverage in urban areas?<sup>a</sup>

### Rural–urban differences

Comparisons of urban and rural or urban and national average coverage figures have been made for data

from 56 countries<sup>b</sup> and are summarized in Table 2. Where urban and rural or national aggregate figures differ, coverage of children is more often higher in urban areas. By contrast, the coverage of tetanus toxoid in women is almost as often higher in rural or national than in urban areas. However, assessment methods may underestimate coverage in urban areas since the surveys measure doses given during the current pregnancy, regardless of need. Cohorts of young women already immunized in childhood are now reaching child-bearing age needing only a booster dose, and women who have been immunized during previous pregnancies also require only a booster. Coupled with a greater frequency of loss of immunization cards in urban than rural areas (indicated by differences between coverage rates found from card records and recalled from memory), women only needing boosters are probably being recorded as not fully immunized in urban areas (WHO data).

Seven studies compared urban and rural health services for missed immunization opportunities. In four cases, missed opportunities were greater in rural areas, while for the three cases where the reverse applied all but one were for tetanus. In particular, opportunities for immunization are missed in urban areas when children are brought to health facilities for curative care,<sup>c</sup> especially in hospitals. No study assessed missed opportunities from visits to the private or NGO services often widely available and used in urban areas.

### Inter-urban differences

Data comparing coverage in the capital city with other large cities or smaller urban centres were found for 18 countries and are summarized in Table 3. No pattern emerged for pregnant women, but the immunization coverage of children was more often higher in the capital than in other urban centres.

### Intra-urban differences

Differences in immunization coverage within a city have rarely been examined. Only three examples were found in WHO/EPI records (Table 4). In Dhaka,

<sup>b</sup> Data sources were mostly cluster surveys following the established WHO/EPI method. A few figures were located in country reports prepared for regional managers' meetings, where the method was unspecified and may represent clinic data or survey data. In Latin America, a number of demographic and health surveys (DHS) have reported EPI coverage by urban and rural residence.

<sup>c</sup> Hutchins S. et al. *Missed opportunities for immunization: review of studies from developing and industrialized countries*. Unpublished document WHO/EPI/GEN/92.8, 1993.

<sup>a</sup> A 10% or more difference in comparisons has been taken as significant, based on the estimated precision of the EPI/WHO survey method (see ref. 21).

**Table 2: Relationship between aggregate urban and rural or national immunization coverage data: frequency of country cases using data from 56 countries<sup>a</sup>**

Antigen <sup>b</sup>	No. of countries with coverage:		
	Urban > rural <sup>c</sup>	Rural > urban <sup>c</sup>	Same
BCG	18	5	29
DPT3	26	6	25
OPV3	21	6	28
Measles	24	9	32
Tetanus	20	13	14

<sup>a</sup> Not all countries had data for all antigens; some countries reported more than one comparison of urban and rural or national coverage.

<sup>b</sup> DPT = diphtheria–pertussis–tetanus; OPV = oral poliomyelitis vaccine.

<sup>c</sup> Comparisons are rural or national coverage figures; national coverage surveys will have been based on mainly rural sites.

the slum areas were surveyed and compared with the situation for the whole Dhaka municipal corporation. Immunization coverage in the slum areas was much lower for all vaccines and was comparable with the lowest coverage rates in rural areas. In Bamako and in Bangkok six different surveys were carried out and, although the areas were not specified in terms of socioeconomic status, a range of coverage rates were reported. In Bangkok, the lowest coverage rates are worse than the lowest rates in twelve rural areas surveyed, while in Bamako the worst coverage rates are comparable to the rural coverage. Thus, although

**Table 3: Relationship between inter-urban coverage data: frequency of country cases using data from 18 countries<sup>a</sup>**

Antigen <sup>b</sup>	No. of countries with coverage:		
	Capital > other	Other > capital	Same
BCG	6	3	11
DPT3	8	2	11
OPV3	8	2	10
Measles	6	2	14
Tetanus	5	4	7

<sup>a</sup> Not all countries had data for all antigens; some countries reported more than one comparison of urban and rural or national coverage.

<sup>b</sup> DPT = diphtheria–pertussis–tetanus; OPV = oral poliomyelitis vaccine.

aggregate figures for urban coverage rates are better than rural, areas exist within the cities where the immunization coverage is as bad if not worse than that in rural areas.

Published studies report a periurban coverage for the third dose of diphtheria–pertussis–tetanus (DPT3) as low as for rural areas, but similar to the higher urban coverage for measles, in one study in South Africa (4), while another found periurban coverage lower than both the urban and rural figures for all vaccines (22). Migrants' children in Cape Town were more likely to be immunized if they were

**Table 4: Intra-urban immunization coverage in selected cities**

City, date, and source	Site	Age range (years)	% coverage for: <sup>a</sup>				
			BCG	DPT3	OPV3	Measles	TT
Bamako, 1991, survey	Commune I	12–23	91	55	55	47	
		II	91	66	66	50	
		III	91	64	64	59	
		IV	91	60	60	52	
		V	89	47	47	39	
		VI	88	49	49	47	
	Rural	64–90	31–64	31–64	22–56		
Bangkok, 1990, survey	1	12–23	100	96	96	82	66
		2	100	98	98	87	62
		3	100	96	96	84	70
		4	100	91	91	80	60
		5	100	92	92	71	67
		6	99	85	85	74	71
	Rural	91–99	79–95	78–95	70–89	64–78	
Dhaka, 1990, survey	Municipal corporation		85	83	83	72	78
		Slums	73	60	60	55	52
	National		100	77	77	64	

<sup>a</sup> DPT = diphtheria–pertussis–tetanus; OPV = oral poliomyelitis vaccine; TT = tetanus toxoid.

born in the city rather than elsewhere (23). In Kampala, surveys following an outbreak of measles, which occurred despite a reported coverage of 71%, showed variations between hospital and mobile services for both coverage and vaccine efficacy (5).

### **Overview**

Despite the overall better coverage in urban areas, improvements would be relatively easy to achieve since further opportunities for immunization would be created if coordination were established between the preventive and curative services on offer at any health facility. Also, private facilities are commonly used in urban areas for curative care, but their potential for integrating immunization activities has not been examined. Urban studies often focus only on the capital, which more often has better coverage than other urban centres, as well as generally having the best health services and the richest segments of the national population, while the underserved segments are often omitted from official statistics. In addition, the municipal authority of the capital is often politically strong and relatively rich compared to provincial cities.

The most important finding is the marked differences within a city, even though the data are few, indicating a major problem in the use of aggregated data. The EPI 30-cluster survey method has been used to assess urban coverage, but bases the estimate on a random sample when the distribution of non-immunized cases is clearly not random. Different approaches are needed to assess coverage in urban areas, which both consider inter-urban differences between the capital and other centres and are sensitive to intra-urban differences.

### **Processes: EPI activities in urban areas**

The processes that influence the utilization of immunization services need to be understood to increase uptake and coverage. The sources from which immunization is sought in the city are important for planning and coordination of fragmented urban health services. Lastly, urban management issues are considered that may affect immunization programmes.

#### ***Why are some sectors of the population not immunized?***

The technical aspects of supply, vaccine efficacy, and cold chain technology are the same both in urban and rural areas, as are some causes of nonimmunization, e.g., not immunizing an ill child, fear of side-effects, and reluctance to open a new vial for one child.

Common sense suggests that geographical access to health services is not the main problem in urban areas and that there must be other reasons for their non-use (24). In urban areas, the distance to the nearest health centre is less, on average, and information has a relatively greater role in determining use (Algeria, 1992; Cameroon, 1990; Chad, 1990). On the other hand, in Alexandra township, South Africa, those least likely to be immunized were squatters and those living furthest away (25). Therefore, although information and motivation seem to be the key factors for urban coverage, distance remains critical in underserved parts of cities.

Urban social interaction often differs from rural through the lack of a common meeting area, fewer extended family connections, and more women engaged in work away from the home, all of which affect flows of information about health and health services. Three studies (Togo, 1989; Tunisia, 1991; India, 1992) on the relative importance of different sources of information specifically about immunization have highlighted the role of personal contact, whether through the health centre, a community health worker, local leader, neighbour or relative. The use of the mass media is clearly more important in urban areas than rural, and this was indicated by Tunisian respondents as the best means for promoting messages. Knowledge, both about diseases and immunization schedules, was greater in urban populations in Tunisia. However, over 97% of respondents in both urban and rural populations expressed the belief that immunization protects against disease. The concept of immunization would therefore appear to be accepted; the issue being rather motivation to return regularly with the child and knowledge of when this should be done. A similar finding was reported in India, where poor uptake of immunization was associated with poor dose-related knowledge rather than overall vaccine awareness (26). However, a crucial design flaw in these studies is that the association between level of knowledge and immunization status may reflect either cause or effect.

The distinction between acceptability, specific knowledge, and motivation is important, since knowledge does not automatically lead to uptake of immunization. Only 57% of Zambian mothers knew that poliomyelitis immunization was needed three times, although the coverage was 90%; and less than half of the women interviewed knew why tetanus toxoid was given, although the coverage was 68%. Specific knowledge of dates may not be necessary where immunization is accepted and health workers provide regular motivation and screen children brought to clinics for curative care. However, the design of follow-up schemes can be problematic in

urban areas with high mobility where the population do not know one another well (WHO/EPI data).

Studies that differentiate between initial and continued immunization have been made in the Islamic Republic of Iran, Conakry in Guinea, and Mozambique (1, 27, 28). Mothers' awareness may influence the initiation of immunization, but its continuation was associated with positive past experience of the health services (27) and the health service organization (1, 28). Mothers attending facilities that offered immunization on three or more days were more likely to have their children immunized. Mothers preferred health centres where curative care was also available rather than outreach services, which only offered immunization, suggesting that resources for outreach should be reduced and more emphasis given to strengthening the fixed facilities (28).

Obstacles to use of health services include not only distance and organization but also economic and social access. In Sierra Leone, for example, while distance was the most important obstacle in rural areas, urban mothers most often said they were too busy to bring their children. A marked drop-off in coverage between the second and third doses of DPT/oral poliomyelitis vaccine (OPV) in periurban areas of South Africa was not explained by poor motivation or poor geographical access, but rather from a specific influence on the children between 5–8 months of age, probably the return of their mothers to work (22). In Conakry, mothers working outside the home were among families considered hard to reach (27).

A study in Port Moresby, Papua New Guinea, reported a poor social interaction between health workers and mothers and emphasized the importance of social aspects for marginalized urban groups (29). Families where the mother was a non-French speaker were among those considered hard to reach in Conakry, Guinea (27). No study was found on the quality of immunization services regarding health worker behaviour and organization of services; also, perhaps more importantly, no evaluation of health services has been made from the user's perspective.

### **What are the sources of immunization in urban areas?**

Seven studies list the source of immunization in urban and rural populations (Islamic Republic of Iran, 1991; Nigeria, 1991; Sierra Leone, 1988; Oman, 1992; Tunisia, 1991; India, 1992; Philippines, 1992). Fixed-site health centres or hospitals carry out the vast majority of immunization in the urban areas, with a much smaller percentage coverage from outreach and mobile services compared with rural areas. However, although outreach accounts for few cases,

the service is considered vital for reaching periurban populations living far from fixed facilities.

The other major difference between urban and rural provision is the involvement of the private sector in urban areas, which is negligible in most rural areas. The private sector performed 18% of immunization in Lagos State, 11% in Freetown, 7% in urban Tunisia, and 6% in Manila. The highest levels were recorded in Teheran and in India, where 25% and 30–45% of immunizations, respectively, were delivered through the private sector. The Teheran study population had higher coverage figures compared with other urban centres, and this was attributed to provision by private practitioners. The real contribution by private practitioners is probably greater than that reported, since attention has only recently been given to the role of the private sector in this respect. Current estimates of the contribution by the private sector to immunization in Lagos State, Nigeria, indicate that the level is 40% (REACH, Nigeria, unpublished results, 1993). A number of countries, including Nigeria and India, are concerned about the lack of quality control in the private sector, either from government monitoring or through self-regulation. No data on coverage or disease reporting are provided by private practitioners.

### **Are there management issues specific to urban areas?**

Three management issues that are relevant to EPI are specific to urban areas: the roles and responsibilities of the Ministry of Health and the municipal health department; coordination between the different agencies providing services; and the importance accorded to immunization within the city health priorities.

EPI, historically directed to rural areas, has been based within the central Ministry of Health. In the capital, the management of urban services is often under the municipal authority, whose relationship with the Ministry of Health varies according to the country. Confusion exists where both municipality and ministry are providing health services in the city, with no clear line of responsibility for coordination. In addition, parallel health systems require duplicated management lines, with the result that senior health professionals in urban areas are often responsible for supervision and monitoring a diverse range of health services, which is overwhelming for the individual and inefficient for the system. The following two studies illustrate the potential problems arising from divided management. In Bombay extra services are being provided to high-risk slum areas, but some "grey areas" exist, defined as new slums that do not fall within the boundaries of any specific government health facility and which are not adequately served. Similarly, in China administrative boundar-

ies, including urban fringes, are at particular risk for poliomyelitis outbreaks (WHO/EPI data).

Thus the tendency for periurban and slum areas to be less well served by services reflects not only the relative newness of such areas, but also the lack of clarity as to who is responsible for action in them. Since disease transmission respects no human-made boundaries, EPI activities in urban areas must be coordinated more closely between municipal, peri-urban, and adjacent district services and effectively implemented across boundaries through regular exchange of information and the establishment of reciprocal agreements for routine immunization and outbreak control.

Urban areas are characterized by a range of different service providers: ministry, municipality, not-for-profit NGOs, and private companies and practitioners. Urban health services have often been described as fragmented, needing coordination to plan a strategy for equitable distribution of services, assurance of service quality, and a citywide system of disease surveillance. The importance of variation in service quality between different providers was demonstrated in São Paulo, where the difference in coverage between the catchment populations of different health centres reflected variations between health centres in their ability to deliver immunization (30). The technical aspects of immunization are well defined and can be relatively easily assessed. What is far less common is an evaluation of health services from the user's perspective, including aspects of user perceptions of risk and motivations as well as positive and negative reactions to the service provided. EPI also has a well-developed training programme into which providers outside of the government agencies can be included once agreement is reached.<sup>d</sup> Countries vary in the legislative control they exert on private practitioners. Some strictly regulate private medical practices, e.g., Oman, where a practitioner is granted a licence for immunization only after inspection of the cold chain facilities (WHO/EPI data).

The incorporation of data for private practitioners into surveillance and planning represents a challenge for urban health information systems. Providing private practitioners with vaccines, syringes and cold chain refrigerators in exchange for data on the number of doses given and disease episodes has proved successful in a number of countries and is being proposed also in Bangladesh, Bombay, Nigeria, and United Republic of Tanzania. Private practitioners are often members of professional bodies

that can be approached for support, e.g., the Philippines Pediatric Society, which has stated its wish to work with the government.

For city planners, many other priorities compete for limited funds, which may affect the impact of EPI. A review of immunization in the Philippines concluded that whereas reasons for low coverage in rural areas were related to the lack of midwives, difficult terrain and disruption of peace and order, the low coverage in cities reflected the low priority given to immunization and the concomitant low resource investment or support from local officials. This left pockets of low coverage, especially among the poorer urban areas. Lack of resources was reflected in lack of maintenance of buildings and the low proportion of staff for the high population densities in some areas.

Other priorities compete with immunization, even for promoting child health and reducing mortality. Among the poorest groups, the major causes of childhood mortality are diarrhoea and pneumonia, which require curative care and health promotion strategies for appropriate preventive and reactive behaviour (WHO data). Closely related to this and to the health of other age groups is the importance of environmental sanitation in urban areas. The epidemiological trends in urban areas require allocation of resources to health education and to care of the chronically ill. As aggregate immunization coverage rates in cities improve, the pockets of childhood disease among the poor and politically powerless are in danger of being overlooked by planners. The health needs of the urban poor may be accorded low priority for three reasons. First, there is a reluctance often to provide services to illegally settled areas, and thus in effect legalize them. Second, the overlapping role of the Ministry of Health and the local municipal government does not clarify whose responsibility the illegal and new settlements fall under. Third, the potential of the poor, non-tax-paying population for political lobbying for basic services is weak compared with other population groups in the city. EPI strategies therefore need to play a role of advocacy for equity as well as assisting in technical support. Part of that advocacy should also be for easy access to basic curative care for children who do contract infections as well as clean delivery facilities for the urban poor women as a second line of preventing neonatal tetanus.

## **Towards an urban strategy**

### ***Urban immunization in integrated primary health care***

The greater use of fixed centres for immunization, the preference for services where both curative and

<sup>d</sup> **Expanded Programme on Immunization. Training modules.** WHO unpublished documents (1991).



preventive services are available, and the potential to increase coverage through organization at health facilities, thereby maximizing opportunities for immunization, indicate that the primary strategy in urban areas should be to strengthen the provision of routine immunization at whatever sources of health care the population is using.

Many of the experiences in rural areas can be transposed to urban immunization. The "supermarket" organization of health services, whereby immunization is always available and children coming for curative care are automatically screened and immunized on arrival or after treatment, has proved successful in urban as well as rural areas in Mozambique, Nigeria, and Zimbabwe (31, 32). An active strategy typical of rural areas has been implemented in urban areas through the use of community health workers, whose role is to follow up families and encourage attendance for immunization and other basic services, as seen in Bangladesh, parts of Brazil, and in Nepal. Training for health staff in technical aspects and in defining problems with current strategies is well developed within EPI, and can be transposed to urban areas.

The provision of primary health care also requires additional urban-specific features. The urban environment presents many opportunities for promotional information on immunization and other health services, particularly through the mass media, although personal contact may continue to be most important. However, the opening hours of public health services may not be convenient for mothers who work away from the home, who then turn to private services (33). Similarly, follow-up visits and door-to-door campaigns can be pointless if the child is not left at home during the working day. Identification of the whereabouts of every child is likely to demand a prohibitive input of human resources; the easier alternative is to have the services open in the evening at least once a week and for half a day on non-working days.

The increasing numbers of private practitioners providing immunization has raised concern in many country programmes; however, it can also be seen as an opportunity. Strategies need to be sought for incorporating the existing private sector into training, monitoring, and quality control. Conflicts in management lines, roles, and responsibilities, particularly for coordination of urban health services, need to be made explicit and solutions sought through joint planning with all partners. The conflicts over the health priorities of different segments of the urban population may require an advocacy role from EPI managers to ensure that adequate resources are allocated to EPI and that it is fully integrated into city health services.

The provision of basic, good quality health care for the growing urban populations requires not only the strengthening of existing services in areas where population density is intensifying, but also new investment in infrastructure and health personnel where the urban population is continually expanding geographically. The experience of EPI suggests that immunization services provide an excellent entry point for other primary health care interventions,<sup>e</sup> and immunization outreach may serve as a focal point for getting basic health care started in the peri-urban areas. The question for EPI managers is what can be integrated with the outreach service without overloading the system and compromising the quality of the services provided? The obvious candidate is other curative and preventive services for child survival, particularly those directed to the prevention and treatment of diarrhoea and pneumonia. Outreach services in urban areas would thus have only a limited role, their resources targeted specifically at new and underserved areas

### ***Immunization for urban disease control***

Ultimately the achievements of EPI will be evaluated in terms of the control of vaccine-preventable diseases, an area in which considerable progress has already been made. Goals for the 1990s include elimination of neonatal tetanus by 1995 and global eradication of poliomyelitis by 2000, as well as a reduction by 95% in pre-immunization levels of measles deaths.<sup>e</sup>

The specific features of disease in urban areas justify extra effort directed to their control. The situation in cities, which are potential reservoirs of measles and poliomyelitis, indicates that urban control may be critical for wider control of these diseases. The geographical variation in population density associated with higher rates of transmission makes a strong case for targeting resources by setting coverage targets according to population density (18). Disease transmission can be interrupted with a lower immunization coverage rate in less densely populated rural areas, whereas the coverage rate will need to be much higher in urban areas to achieve the same effect. Different targets for rural and urban populations have recently been set in Zambia at 85% for the rural population compared with 95% for the urban.<sup>f</sup> A second peak at 5–7 years in the age distribution of cases of measles and poliomyelitis in the

<sup>e</sup> *EPI for the 1990s*. Unpublished document WHO/EPI/GEN/92.2, 1992.

<sup>f</sup> **Jeppson A.** *EPI Progress Report, Zambia*. WHO unpublished document, 1992.

partly immunized population indicates the need to reach older children in addition to the primary focus on those under 1 year of age. School attendance is higher in urban areas than rural, and children can be reached there. The youngest street children, almost always missed by immunization and other health programmes, may be accessible through shelters or soup kitchens, while periodic mass campaigns in specified districts have the advantage of catching older children who were previously missed (WHO/EPI data).

It has been claimed that the drive for poliomyelitis eradication, involving, of necessity, mass campaigns and intensive follow-up networks, is distracting resources from regular health services or routine immunization. In urban areas, campaigns can be run relatively easily compared to rural zones but sustaining the impact may be difficult in areas of regular high influx and turnover (34, 35). Urban areas do present the potential for focusing outreach or campaigns at seasonal troughs to maximize the effect on disease incidence (20). The intensive follow-up of poliomyelitis cases in cities will be critical to eradication and to ensure nondisruption of regular services will need specifically allocated resources. On the other hand, the information systems for the follow-up necessary for poliomyelitis eradication may present an opportunity to facilitate the establishment of reliable disease surveillance and delivery of full immunization.

### **Information needs**

In large cities, more than one survey could be made; for example, sampling from better-off areas, established slum areas, and new periurban areas. Capitals and other cities should be sampled and reported separately. In smaller cities, where the base population of different strata is too small for the EPI 30-cluster method, the lot quality assessment method has been proposed for distinguishing between adequate and nonadequate performance (Lwanga, S.K. & Abiprojo, N. unpublished report) (36). A simple random sample can be carried out in the key areas where the likely problem areas are well known.

Although city health planners normally know where the problem areas for health services are located, investigations of outbreaks demonstrate lower coverage in certain areas than was thought (37) and problems in vaccine efficacy and cold chain quality that were otherwise undetected (28). The use of disease surveillance to detect areas of low coverage or poor immunization quality is reactive rather than preventive but is a quick method for assessing area-specific outcomes of EPI activities. Reporting of disease incidence has not often proved sustain-

able. However, records are kept routinely in hospitals and health clinics and a rapid review can be made periodically to identify risk areas. The campaign for poliomyelitis eradication will require regular reporting and might provide the impetus for a sustainable surveillance system for all vaccine-preventable diseases. However, the trade-off between the long-term benefits of including all vaccine-preventable diseases in an information system against the short-term effectiveness of concentrating on one disease will need to be carefully considered.

Maximizing the convenience and acceptability of health services for the user requires knowledge of what aspects of service delivery are valued, liked, and disliked. In-depth exploration of mothers' perceptions of health services, particularly immunization, can provide a wealth of information on the problems, likes and dislikes, and concerns of the user which can hardly be guessed at from the perspectives of the planner and provider. Few qualitative evaluations by users have been made in the southern hemisphere (38, 39). WHO has developed applied qualitative methods for acute respiratory infections.<sup>g</sup> and rapid methods for needs assessment in urban areas<sup>h</sup> that might be adapted. With the present limited knowledge on how best to present preventive health services in urban areas and the move towards locally defined needs and services, the development of a qualitative approach to identify consumer perspectives may be the most powerful planning tool available to local health and EPI managers.

The policy trend being considered and implemented in many countries towards decentralized planning and management may represent a unique opportunity to meet the specific needs of the urban poor. Decentralization can take different forms depending to what extent decision-making, personnel, and financial resources are handed over to local control (40). None the less, even the most limited form aims for local definition of needs, local planning of solutions, and local monitoring. Local mapping of needs will require support, capacity-building and training, for which EPI is well placed to contribute as part of a more integrated package for primary health care.

<sup>g</sup> *Focused ethnographic study of acute respiratory infections.* Unpublished WHO document, 1993.

<sup>h</sup> *Improving urban health: guidelines for rapid appraisal to assess community health needs: a focus on health improvements for low-income urban areas.* Unpublished document WHO/SHS/NHP/88.4, 1988.

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