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Leading article

Progress in Public Health : The past quarter century

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Introduction

The progress in the field of public health during the past quarter of a century has been remarkable. Many of the achievements are undoubtedly due to the unique health care delivery system, which Sri Lanka has developed over the years, based on the original Health Unit system which affords services to the people at their doorstep.

The first Health Unit was established in 1926 in Kalutara, following which, health units were established over the years to cover the entire extent of the island. In 1970 there were 98 such health units. Each health unit was designed to serve a population of 40,000 to 80,000 people in a well demarcated area. The Medical Officer of Health (MOH) who was in charge, was assisted by public health inspectors who were responsible for environmental health and the control of communicable diseases, public health nurses and public health midwives who were responsible for maternal and child health (MCH) activities including family planning. The supervision of central dispensaries and maternity homes was also the responsibility of the MOH. In later years, school dental services utilising the services of school dental nurses, now designated therapists, were also established, providing services through clinics conducted in selected schools (Figure 1, Section A).

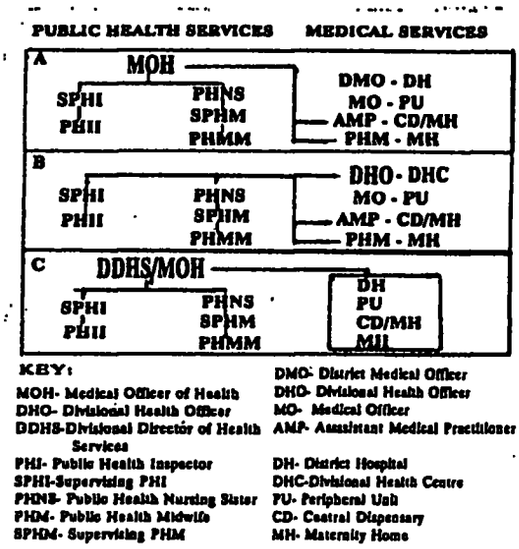
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The health unit system continued to be in operation, lending itself to modifications to suit the changing health needs without the necessity for major changes. Over the years it proved to be a most efficient system for the delivery of public health services.

Figure 1.

Diagrammatic representation of the development of the Divisional Health Services

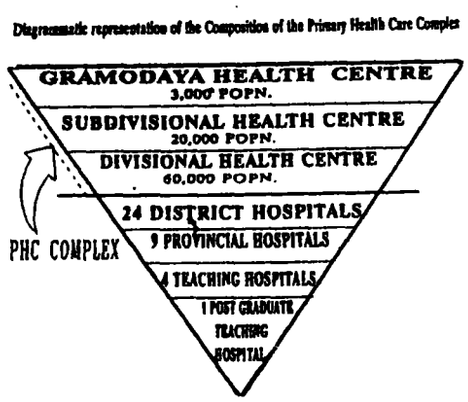
A: Health Unit system
B: DHO system
C: DDHS system



In 1978, the goal for the attainment of Health for All by the Year 2000 through the Primary Health Care approach, was declared at the Alma Ata Conference. Many failed to realise that Primary Health Care as enunciated by the World Health Organization (WHO) was very much part of the health strategies adopted by Sri Lanka in the development of her health system. A feature of her health policy has been an equitable distribution of health services through a well developed public health and curative care network. Failure to realise this fact led to the introduction of a novel peripheral

health care system purportedly to attain the goal of Health for All, through a three-tiered structure called the PHC Complex, consisting of a Divisional Health Centre, a Subdivisional Health Centre and a Gramodaya Health Centre (Figure 2). The post of MOH was abolished and the District Medical Officer was designated the Divisional Health Officer (DHO) and the District Hospital was renamed the Divisional Health Centre. The functions of the MOH were assigned to the Divisional Health Officer. Central Dispensaries were renamed Subdivisional Health Centres and the Public Health Midwife's residence and office was renamed the Gramodaya Health Centre (Figure 1, Section B). Thus the Public Health Services which were field based were effectively converted to an institution-based system. The supposed rationale for this change was that it provided a means to develop an effective referral system for institutional care. The outcome, as expected by many, was that the DHO gave priority to clinical work and failed to administer the public health services effectively.

Figure 2.



The system was not without its benefits: many donor agencies moved in to upgrade the peripheral institutions and provide quarters to staff. A fair number of Gramodaya Health Centres were constructed providing accommodation to public health midwives.

Towards the late 1980s on realisation that the DHO system had failed, the age old Health Unit system was re-introduced.

The devolution of administrative powers to the Provincial Councils in 1987 did not seriously affect the health care delivery system at the divisional level. Most public health functions by then had already been devolved to the divisional level. However in 1992, in order to regain some of the administrative control lost to the devolved provinces, Divisional Secretaries were appointed by the central government purportedly to deliver services to the people at the local level in direct response to their needs and implement national policies, plans, programmes and projects at divisional level. The district (regional) level administration was abolished.

To meet the health needs of the division and to function on par with the Divisional Secretaries, Medical Officers of Health were re-designated Divisional Directors of Health Services (DDHS). The functions performed by the Regional Directors of Health Services were to be undertaken at divisional level by the DDHS. Thus the administration of both the curative services and the public health services was assigned to the DDHS. Today, there are 237 DDHS areas (Figure 1, Section C).

There is now a better mechanism for integration of the preventive and curative services at the divisional level. The system affords a means for better plan formulation based on the needs of the community, effective implementation and close monitoring of activities. There is improved co-ordination of health related sectors and better NGO mobilisation. However, one of the major drawbacks of the system is the reluctance of senior officers to serve in these posts. Inequity in the earning capacity acts as the chief deterrent. Incentives to compensate for loss of earnings may attract more effective leaders.

It is necessary to study the system in greater detail and determine what improvements or modifications are necessary, after the system has been in operation for a few years.

Health transition

To understand the changes that have taken place during the past quarter century, it may be useful to look at some of the health service indicators, then and now.

Table 1: Health Indicators 1970 and 1995

	1970	1995
Crude birth rate (per 1000 popn)	29.4	20.0
Crude death rate (per 1000 popn)	7.5	5.6
Infant mortality rate (per 1000 LB)	47.5	17
Maternal mortality rate (per 1000 LB)	1.5	0.4

It is evident that significant improvements have taken place during this time. We have also been able to reduce mortality, increase the expectation of life at birth to 72 years, control population growth, improve maternal and child health and control many infectious diseases, particularly the vaccine preventable diseases of childhood. Malaria, however, which was under control in the early sixties erupted in epidemic form in the late sixties and has continued as a major public health problem and new diseases such as Japanese Encephalitis, Dengue Haemorrhagic Fever and HIV/AIDS have now emerged. There is the potential danger for the introduction of diseases which are now gaining importance globally such as Marburg disease and Ebola virus infections. Diseases such as plague and tuberculosis are also likely to re-emerge as in other parts of the world. With the reduction in communicable diseases and the increased life expectancy, non-communicable diseases have also gained importance as public health problems.

I propose to consider briefly some of changes that have occurred during the past quarter of a century and how they have affected the health of the people in general and the public health services in particular.

Population issues

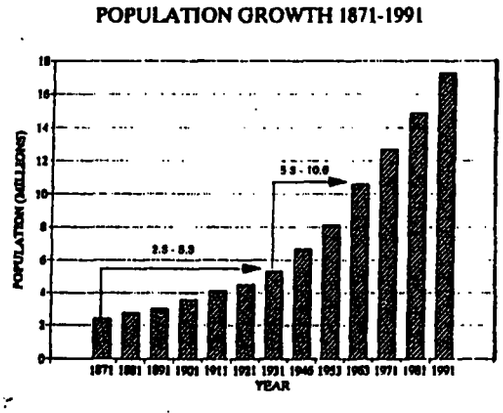
In the early 1950s, one of the main concerns of government was the rapidly increasing population. Although family planning (FP) services were introduced by the Family Planning Association in 1953, government initiatives in family planning commenced only in 1958 with the establishment of a pilot project to study the prospects of introducing family planning into the general health services. Based on the experience gained in the project, the government decided to accept family planning as part of national policy and the Ministry of Health was assigned the task of providing family planning services through its MCH infrastructure. Family planning as a means for reduction of population growth proved unacceptable to certain sections of the community who attributed a sinister motive to the population activities of the government. Success was, however, achieved by the government strategy of emphasizing the benefits of family planning with regard to maternal and child health and by integrating the FP programme with the MCH programme. A separate division designated the MCH Bureau, later to be re-designated the Family Health Bureau, was established in 1968 to implement the programme.

The role played by non-governmental organisations during the early period, when discretion on the part of the government was considered necessary, is commendable. The Family Planning Association played a leading role in offering services to the people, which they continue to do even today.

A study of the reduction in population growth during this period demonstrates our achievements.
Figure 3 shows the population growth from 1871 to 1991. It took 60 years for the population to double from 1871 to 1931- from

2.4 million to 5.3 million, but only 33 years for the population to double from 5.3 million in 1931 to 10.6 million in 1963. However, during the past three decades there has been a substantial slowing down of population growth, the annual population growth rate declining from 2.8 percent in the 1950s to 1.2 percent in 1995. The reduction in growth rate can be attributed to the rising age at marriage, fertility decline and out-migration. The main reason for the decline in fertility has been the increase in contraceptive use during this period which was poss ıle mainly through the efforts of the public health services complemented by the services provided by non-governmental organisations.

Figure 3.



The population of Sri Lanka is estimated to reach 19 million in the year 2000 and stabilise at 24 million by 2050. In order to achieve this goal, 72 percent of married women should be using effective family planning methods by the year 2000. It is estimated that in 1991 about 1.7 million women were using a family planning method. This number needs to be increased to 2.1 million in 2001. Thus, in the next ten years an additional 40 thousand couples need to be motivated to start using a family planning method each year, a formidable task for our public health services!

Figure 4 shows the change in the age structure of the population over the past decades and predictions for the future. It is evident that there will be a gradual increase in the labour force and the elderly population, with a marked reduction in the child population.

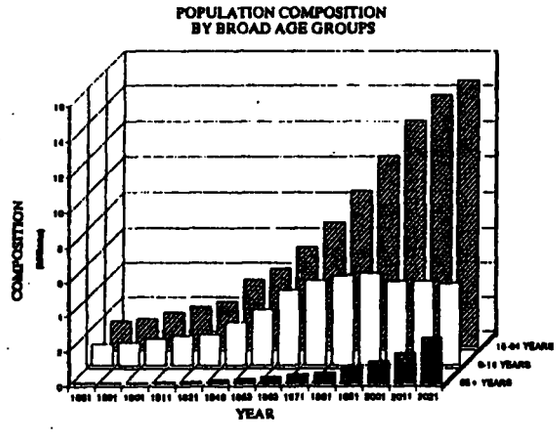
This implies that:

- the demand for services for children will not increase quantitatively, thus providing opportunities for enhancement of the quality of care

- health problems among adolescents and the working population would demand appropriate, additional services

- health problems associated with ageing will increase and there will be an increased demand for services by the elderly.

Figure 4.



Changing patterns of morbidity and mortality

Population changes are inextricably linked with changes in disease patterns. In this context it would be relevant to consider the changing patterns of morbidity and mortality during the period under consideration.

One of the crowning achievements of modern international public health in the last quarter

century was, undoubtedly, the eradication of smallpox. The last case of small pox was reported from Somalia in October 1977 and by the end of 1979, the Global Commission for the Certification of the Eradication of Smallpox certified that smallpox had been totally eradicated. When the intensified global programme for the eradication of smallpox commenced in 1967, Sri Lanka had already achieved eradication status. This was achieved by an extensive vaccination programme backed by legislation and effective surveillance. However, the last reported case of smallpox in Sri Lanka was a German lady tourist, aged 23 years, who had arrived in Kandy from Kabul in Afganistan through Pakistan in 1972. No secondary cases occurred.

Vaccine preventable diseases

Sri Lanka has been able to reduce the incidence of many other vaccine preventable diseases during this period. BCG vaccination was introduced as far back as 1949, followed by DPT vaccination in 1961 and Oral Polio vaccination in 1962. Neonatal BCG vaccination was introduced in 1969. An Expanded Programme on Immunisation (EPI) using these vaccines was initiated in 1978 and island wide coverage was obtained in 1979. Measles vaccine was also introduced in 1984 and island wide coverage achieved in 1985. The EPI programme was accelerated in 1985. Extremely good coverage was achieved in the administration of these vaccines, acceptability was increased through community health education and the introduction, with UNICEF assistance, of one of the pioneer mass media programmes applying the techniques of Social Marketing to health promotion. This technique was later to be used in the control of leprosy with considerable success. It was possible to declare Universal Child Immunisation in December 1989, signifying that vaccine coverage exceeded 85 percent in respect of all vaccines. The outcome of these achievements is seen in the decline in the incidence of all these diseases (Figure 5).

Poliomyelitis

Sri Lanka has now embarked on a programme to achieve the global goal of eradication of poliomyelitis by the year 2000 along with the elimination of neonatal tetanus. Figure 6 shows the incidence of poliomyelitis during the period 1951 to 1994. The cyclical occurrence of epidemics is clearly discernible. The first major epidemic occurred in 1962 when 1810 cases were recorded.

Polio vaccine was introduced into Sri Lanka a few months after the onset of the epidemic. It was a sugar-coated pill from the USSR! The now familiar drops, which children and adults find easier to swallow, were introduced subsequently.

The administration of polio vaccine was eventually implemented through the public health network as a routine immunisation. In the very early days there was resistance to its administration, and coverage was improved by conducting annual mass immunisation campaigns. With the creation of public awareness through intensive education, mainly through the efforts of the public health field staff, a public demand for immunisation has now been created. Today, we have reached a stage where the incidence of poliomyelitis is virtually zero. Thus, eradication of the disease is an achievable goal.

With this objective, the surveillance and immunisation mechanisms have now been activated and the implementation of National Immunisation Days have commenced from 1995 and will be continued for the next three years. The objective of this exercise being to replace the wild polio virus in the environment with the vaccine virus. We are confident that Sri Lanka will achieve total eradication before the end of this century.

Whilst remarkable successes have been achieved in controlling the spread of these vaccine preventable diseases, other

communicable diseases continue to affect the population. I do not propose to deal with all of them, but will consider some which are of public health importance. I will also refer to some emerging communicable and non-communicable diseases. In doing so I hope to allude to some of the common problems faced in implementing preventive health programmes.

Figure 5.

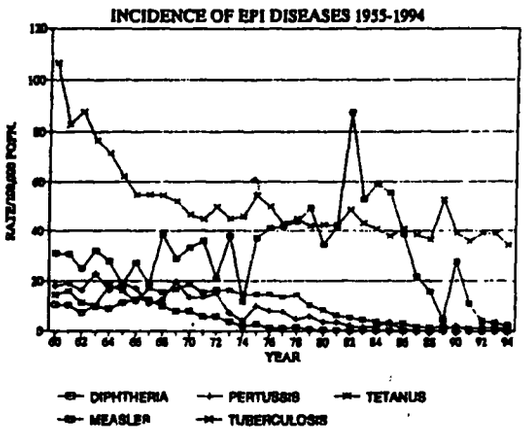
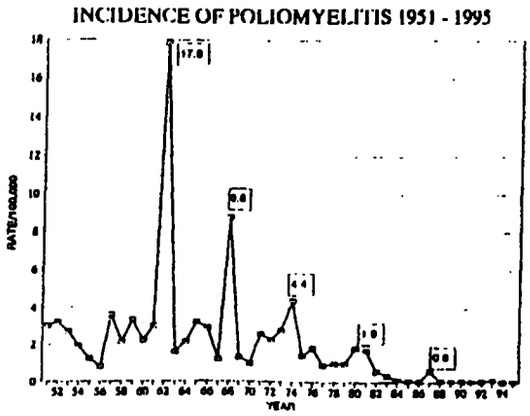


Figure 6.



Malaria

In 1946, Sri Lanka was one of the first countries to launch an islandwide insecticide programme for malaria control using DDT. The dramatic decline in the number of cases prompted Sri Lanka to embark on a malaria eradication programme in 1958. By 1963 only 17 positive cases were recorded (Figure 7); eleven of them were imported cases from the Maldives. But by 1969, over half a million cases were recorded. Further peaks were recorded in 1976 (400,797 cases) and in 1987 (676,569).

The failure of the time-limited Eradication Programme led to the adoption of a long-term Control Programme in the 1970s. Malaria has since continued as the major public health problem utilising about 9 percent of the total expenditure on health and about 39 percent of the public health budget annually.

In July 1993, Sri Lanka adopted the New Global Strategy for Malaria Control recommended by WHO, which shifted the emphasis from intensive vector control measures to case detection and prompt treatment. Spraying operations are now performed selectively. Elimination of the source of infection, which is now recommended by WHO in its new strategy is obviously the most logical action when considering the dynamics of malaria transmission.

Due to the development of resistance to DDT by the mosquito, the more expensive malathion was introduced in August 1977. Malathion was not readily acceptable to the community due to its obnoxious smell and its ability to discolour furniture. Being a good agricultural pesticide much of it was used for that purpose although imports were restricted to the health sector!

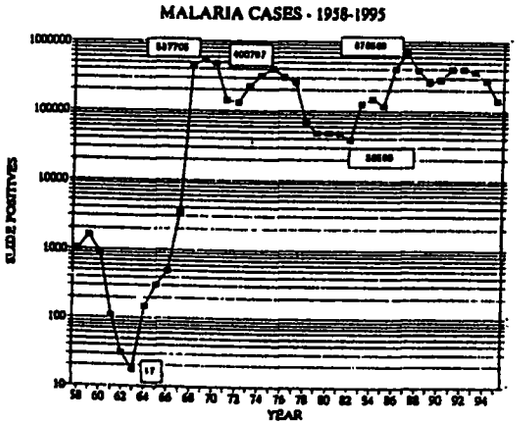
The use of chemically unrelated insecticides in different districts with the objective of delaying the emergence of insecticide resistance, is now practised on a limited scale. Fenitrothion and

lambda cyhalothrin are two such insecticides now used and found to be promising.

The incidence of malaria appears to show a dramatic decline in areas where the new strategy has been effectively translated into action and in areas where the more acceptable alternative insecticides are used. This however. has to be interpreted in the light of the expected natural decline in its incidence (Figure 7).
More problems appear to be emerging which are likely to affect the control of malaria in future years. The proportion of falciparum malaria cases as well as the number of chloroquine resistant falciparum malaria cases are increasing in some regions of the country, particularly in the Hambantota District.

Thus, if this trend continues the eventual control of malaria may have to await the discovery of an effective vaccine!

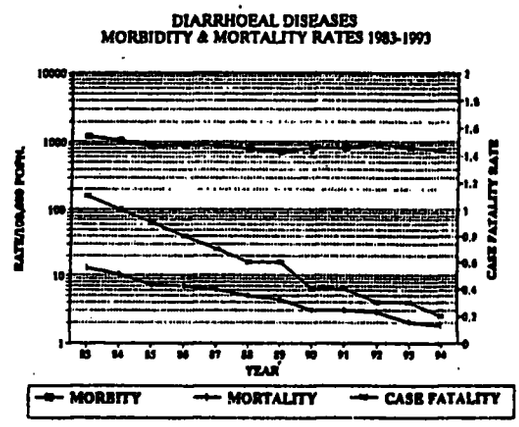
Figure 7.



Diarrhoeal diseases

Diarrhoeal diseases have over the years been an important cause of morbidity. Figure 8 shows the hospital morbidity and mortality rates for diarrhoeal diseases. It is evident that although there has been an appreciable decline in the mortality from diarrhoeal diseases from 1983, there has not been an appreciable decline in morbidity from it.
Early detection, treatment with home-based fluids and oral rehydration salts, early referral and better case management, which are measures introduced through the Control of Diarrhoeal Diseases Programme that commenced in 1983, has helped to reduce mortality in hospitalised patients. But morbidity has not been so affected, as measures to remove the causative factors have not been effectively introduced through the programme.

Figure 8.



Prevention of diarrhoeal diseases would to a large extent depend on improvements in environmental sanitation, particularly the provision of safe water and sanitation, and ensuring the safety of food.

Provision of facilities for the sanitary disposal of human waste has engaged our attention for many decades. Data collected during the Housing Census in 1981 showed that 31 percent of households in the country were without toilet facilities - 35 percent in rural areas and 16 percent in urban areas. Data available from the Data Bank of the National Water Supply and Drainage Board, indicates that the situation has become worse. Today 39 percent of households do not have toilet facilities. Thus, more than a million households

are without toilet facilities. Implementation of a Million Toilets Programme might be a possible means to overcome this problem!

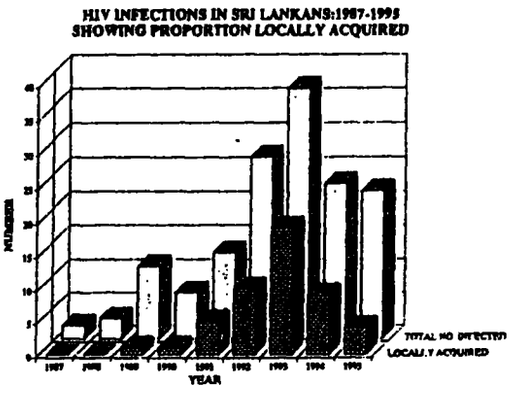
One of the chief impediments to the provision of these facilities is the cost of construction, which poor villagers can ill afford. Using local resources, both manpower and materials, designing a low cost type of sanitary latrine and the provision of a more realistic financial subsidy may help to overcome this problem.

Emerging problems

Some new diseases have emerged as public health problems in the recent past.

AIDS which was first discovered in the United States of America in 1981, was first detected in Sri Lanka in 1987. Up to the end of 1995, only 145 HIV positive cases were detected in Sri Lankans.

Figure 9.



The first case acquired through local transmission was reported in 1989. Since then local transmission has steadily increased from nine percent in 1989 to 51 percent in 1993. In 1995, locally acquired cases declined to 15 percent. From Figure 9 it is evident that the number of HIV cases detected annually has increased upto 1993 and shown a decline from 1994. If this trend persists Sri Lanka will continue as a low prevalence country in future years. However, predicted trends in the Asian Region do not support this interpretation - the incidence of the disease is predicted to continue rising beyond the year 2000, unlike in the other regions of the world where it has already started to decline.

The unique features of AIDS with its complex social, moral and psychological factors, as well as the legal and ethical issues involved, makes the handling of preventive measures a complex and difficult task which we would have to face in the coming years.

Non-communicable Diseases

With many communicable diseases now under control, countries such as ours are now facing new problems arising out of the changing population structure. Undernutrition, a long-standing problem especially among children continues unabated.

With the increasing number of adolescents and working people as well as an increasing elderly population, the health services will also have to deal with new problems arising from the changing life styles of people. Diseases of stress and inability to cope, problems of adolescents, diseases related to work, and diseases due to ageing will assume greater importance in the future.

Non-communicable diseases are thus gaining in importance as diseases which would require specific prevention and control efforts in the future.

A study of the leading causes of mortality lends support to these expectations. Ischaemic heart disease, cerebrovascular disease, diseases of the pulmonary circulation and other heart disease and poisoning with pesticides are among the first five. Traumatic injuries constitute the second leading cause of hospitalisation.

Non-communicable diseases that are likely to be of public health importance are: cardiovascular diseases; cerebrovascular diseases; diabetes mellitus; accidents on the road, at work and in the home; pesticide poisoning; mental illnesses including alcoholism, drug abuse and suicides; sexual disorders; and cancers, particularly in the aged.

Although the principles of prevention of these diseases are not essentially different from those adopted to control communicable diseases, the approaches would necessarily have to be different. Primary preventive measures would be devoted to changing attitudes and life styles of people through education. Early detection and treatment as well as the prevention of disability will constitute secondary and tertiary preventive measures. The need for high technology equipment and expensive treatment regimens for the diagnosis and treatment of these diseases will have to be considered by health planners in the years to come.

Much of the educational activities for primary prevention as well as for early detection of these diseases can be undertaken through the existing field services, which have adapted themselves over the years to meet such new situations very effectively. Community based rehabilitation services, particularly for the aged and disabled could also be provided through them.

Thus, with a little modification in the existing system, the public health services should be able to adapt itself to these new demands.

Conclusion

Thus in the coming years, Sri Lanka will experience a gradually diminishing child population affording opportunities for enhancing the quality of the MCH services. The problems of adolescents and the working population as well as the ever increasing elderly population will have to be addressed.

In this short article, which is by no means comprehensive, I have tried to describe the successes and failures of the public health sector in the recent past and attempted to analyse the reasons for them. Attention has also been drawn to what the future holds for us, so that we could be prepared to face its challenges.

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