

INFANT MORTALITY RATE
IN THREE PARISHES OF WESTERN JAMAICA, 1980

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ABSTRACT

The infant mortality rate is a sensitive index of health. However, in recent years, perhaps due to under-registration of deaths, the infant mortality rates of Jamaica, and particularly of certain parishes, have been so low as to make their reliability questionable.

This study sought to establish the infant mortality rates for the parishes of St. James, Hanover and Trelawny during 1980. Information on infant deaths in 1980 was sought from a variety of sources, as was information on live births in the same year.

Fewer than half of all infant deaths appeared to have been registered in 1980 in the parishes studied. The infant mortality rate for 1980 was 27 per thousand live births for these three parishes combined.

The apparent under-registration of infant deaths is discussed.

ABBREVIATIONS

The following abbreviations have been used:

- IMR - Infant Mortality Rate
- CHA - Community Health Aide
- PHN - Public Health Nurse (including Senior Public Health Nurse)
- PHI - Public Health Inspector (including Chief Public Health Inspector)
- R-G - Registrar-General or Registrar-General's Department
- RBD - Registrar of Births and Deaths
- CRH - Cornwall Regional Hospital

INTRODUCTION

Jamaica is divided into 4 health areas for the administration of primary health care. The Western Area corresponds to the county of Cornwall, comprising the 5 parishes of Trelawny, St. James, Hanover, Westmoreland and St. Elizabeth. Montego Bay is the main urban centre of Cornwall, and tourism and bauxite mining are important sources of income. The county is mainly rural, and small-scale agriculture is the main occupation of the people.

Type I health centres, providing mainly maternal and child health services, are the smallest and most peripheral kind in a hierarchy of health centres of varying degrees of sophistication. This network of health centres is the result of innovations made in the health services in Cornwall during the mid and late nineteen seventies. Type I health centres are usually staffed only by a district midwife (DM) and 1 or more community health aides (CHAs). The CHA service itself is something of an innovation, for CHAs were employed in large numbers in Cornwall for the first time in 1972. Each CHA serves an area with about 1000 population; among other things, it is a CHAs responsibility to be aware of all births and deaths occurring in families in her district.

This study arose from a need to evaluate the effectiveness of these upgraded services in Cornwall. It was, however, limited to the 3 parishes of St. James, Hanover and Trelawny.

The infant mortality rate (IMR) (number of deaths in babies less than 1 year of age per 1000 live births, in a given period) is one of the most useful indices of health in a population. It reflects the quality of the maternal and child health services, the standard of nutrition of babies, standards of sanitation, hygiene and environmental control, and standards of maternal education and care of children. It is very sensitive, falling or rising more quickly than certain other indicators (e.g. life expectancy) in response to changing conditions, and can be calculated and made available relatively easily from information gained from routine registration of live births and infant deaths. Sometimes the definition is given with the phrases 'registered infant deaths' and 'registerd live births' included. The validity of the IMR, and hence its usefulness, depends on the completeness with which births and deaths are registered.

With improved standards of living and improved health and environmental control services, Jamaica's IMR has fallen rapidly this century. By 1975, it was 23 per 1000 (Population Reference Bureau, 1975), much lower than contemporary rates for Latin America as a whole (79), for any individual country in continental South or Central America, for India (139) and Africa (156); the rate was comparable to the rates for Taiwan (28), Cuba (25), and Trinidad and Tobago (35), but higher than those for North America (18) and all countries of Northern and Western Europe (10-24 per 1000). It had been recognized that there was a small degree of under-registration of young child deaths in and around Jamaica's capital city in the late 1960s (Puffer and Serrano, 1973), but the IMR by the late 1970s had become so low (16 in 1978) (Table 1) that it was questionable whether this was even a rough estimate of actual mortality rate; the very low rates for some parishes seemed extra-ordinarily low, e.g., in Hanover and Trelawny in 1977, the published IMR was 3 per 1000, lower than that for any country in the world.

Table 1. Infant mortality rate (per 1000 live births) in Jamaica, 1915-1978, and in 3 parishes of Cornwall, 1970-1978

Year	PARISH				
	Jamaica (all parishes)	St. James	Hanover	Trelawny	St. James, Hanover, Trelawny combined
1915	175	/	/	/	/
1930	141	/	/	/	/
1945	102	/	/	/	/
1960	51	/	/	/	/
1970	32	28	40	34	32
1971	27	29	26	33	30
1972	31	26	30	31	28
1973	26	20	47	21	27
1974	26	34	17	22	27
1975	23	29	11	11	21
1976	20	22	11	13	18
1977	15	23	3	3	14
1978	16	27	7	6	19

It is possible that some annual fluctuations in the IMRs shown in Table 1 are caused by events taking place in Cornwall in the seventies (Standard and Ennever, 1978). The Cornwall Regional Hospital (CRH), a large new hospital with many facilities, opened in 1974 in Montego Bay in the parish of St. James. The services of this new hospital should, on the one hand, have reduced the number of infant deaths occurring and, on the other hand, have promoted better registration of the deaths which occurred at the hospital, for the hospital registers its deaths directly with a particular Registrar of Births and Deaths (RBD) in Montego Bay; the net result of these changes could not be predictable. Since deaths at the CRH are included in the figures for St. James, regardless of the usual place of residence of the deceased person, from 1974 onwards it might be expected that IMRs for St. James would rise relative to those for Hanover and Trelawny, which are also served by the CRH. This does appear to have happened and, hence, the last column in Table 1, combining the figures for the 3 parishes, has been presented in an attempt to show a more balanced picture for the region.

Other changes which may have affected the IMRs shown in Table 1 are the introduction of large numbers of CHAs into service for the first time in 1972 - 126 of them in St. James and 136 in Hanover. These personnel may, on the one hand, have helped to reduce infant mortality by the services they gave and, on the other hand, have stimulated better reporting of infant deaths, thus increasing the apparent IMR. These 2 effects would tend to counteract each other. The data for the 3 separate parishes shown in Table 1 do not indicate any clear effect on the reported IMRs, however, so no conclusions as to the effect of the work of the CHAs on the IMR can be drawn. In 1976, 42 CHAs started service for the first time in Trelawny, and any changes in Trelawny's IMR after that may be due to the work of the CHAs.

The IMRs for the 3 parishes combined have been similar to those for Jamaica as a whole for the period 1971-1978. CHAs were introduced to the rest of Jamaica later and in smaller numbers than were those in St. James and Hanover. On the evidence of the IMRs shown in Table 1, only, however, there is no evidence that any reduction in mortality in the 3 given parishes has been greater than reduction in mortality for Jamaica as a whole.

Since the published IMRs in recent years have been so low, especially for certain parishes, it is important to attempt to establish whether they reflect true situations and can be used with confidence as health indices, or whether they underestimate the actual mortality rates and thus are not useful. The aims of this study were, therefore, to (i) establish the total number of infant deaths occurring in 1980 in St. James, Hanover and Trelawny and (ii) use that information, along with information on live births compiled by other persons/institutions, to calculate IMRs for the 3 parishes for 1980.

METHODS

The study was done in the parishes of St. James, Hanover and Trelawny during 1979-1981.

1. Infant Deaths (1980)

In late 1979, the intention of the research team to learn of all infant deaths in 1980 in the three parishes was discussed by senior health staff in Cornwall. The staff agreed to cooperate in distributing simple index cards to all health centres and asking that whenever staff became aware of the death of an infant in 1980, one of these cards should be filled in, giving name of child, name of parent(s), guardian(s), usual address, date of birth, date of death, sex of child, and identity of informant.

Some information on infant deaths was collected this way during 1980, though, in practice the plan was not actively followed up by the investigators, not all health centres received these cards, and not all staff became aware of the proposed study. Data collection during this period formed only a minor part of the whole.

The major part of the data was collected between January and March 1981. All 292 CHAs in the three parishes were contacted, either at meetings at health centres or at their homes, according to the convenience of the CHAs and of the investigators, and information was sought from them retrospectively about infant deaths in 1980 among families in their districts. A card (as previously described) was filled out for each known infant death. The CHAs' records, or health centres' records, and occasionally the parents of the deceased children, were contacted, as necessary, to ascertain exact details.

During the same period, all RBDs (20 in St. James, 22 in Trelawny, 17 in Hanover) in the 3 parishes were visited and information from their records pertaining to infant deaths in 1980 was copied onto the index cards in use by the investigators.

Also during the same period, records of infant deaths occurring at CRH, Falmouth Hospital (Trelawny), Ulster Spring Hospital (Trelawny), Noel Holmes Memorial Hospital (Hanover) and hospitals in adjacent parishes but close to the borders of the parishes being studied - Spaldings Hospital (Manchester), Alexandria Hospital (St. Ann) - were examined, and records of infant deaths copied onto index cards.

After independent collection of information on infant deaths from these various sources, index cards were collated and any multiple entries for the same infant were analysed as a single entry. Deaths occurring at the CRH were analysed according to the usual parish of residence of the deceased.

2. Live births (1980)

Three sets of information on live births in 1980 were sought for possible use in calculating IMRs:

- (i) the number of registered live births compiled at the parish Health Departments from information gained by collaboration between PHIs and RBDs,
- (ii) the number of live births, registered or not, compiled at the parish Health Departments by PHNs, who obtain information from CHAs under their supervision, and
- (iii) the number of registered live births as published by the R-G.

RESULTS

The total numbers of infant deaths found to have occurred in 1980 are shown in Table 2 (Row A); there were 109 in St. James, 31 in Hanover and 39 in Trelawny. The number of infant deaths registered with the RBDs is shown in Row B of the table. The registered deaths are shown as a percentage of all infant deaths in Row C, the overall result being that 31% of all infant deaths in 1980 in the parishes studied were registered.

Rows D, E and F of Table 2 show the information obtained on live births from 3 sources. This information was not available through the CHAs/PHNs' compilation for 1 parish, and for another was seen to be incomplete by comparison with the figures of Rows D and E and is not shown in the table.

IMRs for the 3 parishes were calculated using the data of Row A for infant deaths and using the highest figure from Rows D, E and F for each parish for live births. The combined IMR for the 3 parishes was calculated using as denominator the sum of the highest figures for individual parishes (3826 St. James; 1242 Hanover; 1606 Trelawny). The combined IMR for the 3 parishes for 1980 was 27 per 1000 live births.

Table 2. Infant deaths, live births and IMRs by parish, 1980

Data	Source of information	Parish			Three parishes combined
		St. James	Hanover	Trelawny	
<u>Infant deaths</u>					
A Reg'd & unreg'd	All sources (see Methods)	109	31	39	179
B Reg'd	Records of RBDS	34	6	16	56
C Percentage of deaths reg'd	A/B x 100	31	19	41	31
<u>Live births</u>					
D Reg'd	Data compiled by R-G	3826	1203	1606	6635
E Reg'd	Data compiled by PHIs/RBDS	3569	1242	1243	6054
F Reg'd & unreg'd	Data compiled by CHAs/PHIs	(not available)	1230	(incomplete)	(not available)
IMR	1000 x A highest of D, E or F	28	25	24	27

Abbreviations: Reg'd = Registered Unreg'd = Unregistered

DISCUSSION

The IMR of 27 per 1000 live births found in this study for the combined parishes of St. James, Hanover and Trelawny may, perhaps, be extrapolated to the whole of Jamaica, for during the years 1970-1978 the rate for the 3 parishes combined was very similar to that for Jamaica as a whole (Table 1). Since there is no obvious reason why this relationship should have changed, it could be deduced that in 1980 the IMR for Jamaica as a whole was close to 27 per thousand. This level indicates that young child health in Jamaica is about the same as that in certain other Caribbean countries (see Introduction), but not yet as good as that attained in more developed countries with greater resources.

A considerable under-registration of infant deaths was found by this study - only 31% of infant deaths of which the investigators became aware having been registered. There is no way of knowing whether the published IMRs of recent years might also have been affected by such under-registration, though this seems a distinct possibility.

In the following paragraphs, possible sources of error in data collection are considered.

Much of the information on infant deaths was reported to the authors by CHAs. All CHAs working in the 3 parishes at the time were seen, so there would be no loss of information from that point of view. It seems highly unlikely that CHAs would report non-existent deaths to the investigators, but if coverage of population were incomplete there might have been under-reporting of deaths by the CHAs; in theory this should not happen, for all areas are covered by CHAs, who ought to be aware of all deaths occurring in their communities, but it is not possible in practice to state whether any deaths were missed or not reported by the CHAs. The ratio CHAs:population in Hanover is at least twice as high as that in any other parish in Jamaica and, though St. James has many more CHAs than does Trelawny, both of them rank high among all the parishes of Jamaica in terms of the ratio CHAs:population. However, although the 3 parishes are all relatively well served by CHAs, the possibility of under-reporting of infant deaths remains.

The records of all RBDs in the 3 parishes were examined for infant deaths, so no loss of accuracy should have occurred from that aspect of the study.

Although dates of birth were not confirmed by scrutiny of birth certificates and, hence, exact age at death could not be confirmed by that technique, it was sometimes possible to cross-check dates of birth: if a child had been born and died in the same district, and if both events had been registered, they would both have been registered by the same RBD. When this happened the investigators checked dates of birth from records of birth registration to confirm that death occurred before 12 months of age. This cross-checking could only be done for a fraction of the children, and was not

done on all the occasions possible, but when it was done the investigators found that ages at death on the RBDs' records were accurate.

A possible source of error in the calculation of IMR was in the number of live births used in the calculations. In St. James (Table 2), it was possible to obtain this information from 2 sources, and there was a slight discrepancy between them - the number of live births given in a report from the R-G's office in mid-1981 was 3826, a little higher than the figure from the Health Department from RBDs in the parish (3569), though both arose from the same source (RBDs' records). The discrepancy is unexplained, but in any case the higher of the 2 figures was used in analysis as probably being the more correct. In Hanover, 3 compilations of numbers of live births were available to this study, all agreeing closely with each other and indicating reliability. For Trelawny, the figure supplied by the R-G was much higher than data supplied by health staff, and presumably was the more complete.

Whatever the source of information used for live births in 1980, its completeness cannot be estimated here. To the extent that there is any under-registration of live births by RBDs, however, the IMR reported here will be over-estimated.

Any infant deaths occurring in 1980 but registered later than January-March 1981, and not otherwise reported to the investigators (by CHAs, etc.) or not discovered by them, would not enter into the calculation of the IMR presented here. Again, although no rigorous scrutiny was made by the investigators, it was their impression that registrations in 1980 of deaths in 1979 were very few, hence it may be extrapolated that late registrations (in 1981) of deaths in 1980 were few also, and would not seriously affect the IMR found here. For these and other reasons given, the authors believe 27 per 1000 to be a fairly reliable estimate of the IMR.

If an infant death occurs at home, there are several reasons why infant deaths may not be registered. Several health workers, of various categories, have suggested to the authors that bereaved families, especially those living in isolated areas and especially if a baby dies soon after birth, simply bury the dead child without registering its death; other personnel have vehemently denied that this could happen, pointing out that adherence to normal legal procedures helps the parents by absolving them of the appearance of any foul play. Again, some colleagues have suggested to the authors that a live-born child who dies shortly after birth could be regarded as a still-birth, to alleviate distress and the need for some registration procedures; other colleagues have denied this, saying it is important to the reputation of midwives and 'nanas' (unqualified birth attendants) to let it be known that the babies they helped to deliver were born alive. It is possible that some members of the public are ignorant of the legal requirements to register infant deaths.

Procedures for registration of death are somewhat complicated to any but those directly involved: the procedures vary depending on whether or not there is need to report to the police or to have a post-mortem performed. However, they are designed so that burial is not possible without authorization; such authorization depending on registration in the first place. It would, at first sight, then appear that once a death is brought to the notice of the authorities (medical practitioners, police, RBDs) the death will be registered. On enquiry, however, certain situations exist whereby a death which is brought to the notice of the authorities or which relatives attempt to bring to the notice of the authorities may still not be registered. These are discussed briefly in the next paragraph.

In a recent report (Sinha *et al*, 1981), it was pointed out that RBDs may sometimes be away from their homes or offices, on leave, and that usually no arrangement for a substitute is made; they may be away for some months, and yet the legal requirement is that registration must be made in the district where the death occurred, so that the relatives cannot but postpone the registration. It is possible that they do not bother to make a late registration when the RBDs resume work. It is reliably reported to the authors that a RBD in a hurry may give the bereaved family the form authorizing burial, without in fact registering the death; this can happen in practice as there is no later cross-checking of death registration forms with certificates "for burial after registry".

It is possible that a few deaths reported here as "unregistered" were registered by a RBD outside of the three parishes concerned, for this study analysed information according to the babies' usual place of residence. If there was a systematic tendency, say, for sick children to be taken outside of these parishes and die away from home, this study would over-estimate the proportion of infant deaths which were unregistered. Such a pattern of events is not thought to happen, however.

Infant deaths occurring in hospitals should all be routinely registered, so deaths in hospitals should not account for under-registration. The authors found that infant deaths occurring in the Cornwall Regional Hospital were registered at very frequent intervals with the appropriate RBD, hence, there is no reason to suspect under-registration there. No attempt was made to check whether these procedures were being adhered to at other hospitals.

The study did not attempt to discover from individual families their reasons for non-registration of infant deaths, though this information, if it could be found, would be of value in any attempt to improve the completeness of registration of infant deaths. Further research into the subject is needed.

Conclusions

The infant mortality rate for 1980 for the combined parishes of St. James, Hanover and Trelawny was estimated to be 27 per 1000 live births. It was estimated that only 31% of infant deaths in 1980 were registered, though any late registrations were not taken into account. Health personnel were much more aware of infant deaths than were the RBDs and, hence, the R-G.

Several possible reasons for under-registration of infant deaths are suggested, but the topic requires further research.

Attempts should be made to improve the registration of infant deaths.

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