

Exploring factors associated with completeness of parental survival data in a longitudinal surveillance system in rural South Africa

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Background: During the past two decades, rural communities in South Africa have experienced a rapid and severe HIV epidemic. The consequences of premature deaths of young adults have reported high orphaning rates (Hosegood et al 2007, Hill et al 2008). Reliable data on the levels and trends of orphaning are needed to monitor the effectiveness of intervention programmes and policies directly or indirectly targeting orphans (Madhavan et al 2014). The most widely used parental survival data is that available from cross-sectional surveys or censuses. However, in communities in southern Africa where orphaning rates are high and many children are not co-resident with living parents (Hill et al 2008), there are many reasons to anticipate that intentional and unintentional misreporting and bias in cross-sectional surveys may reduce the accuracy of orphanhood estimates.

Objective: The main aim of the paper is to examine the completeness of parental survival status over time using longitudinal data from a demographic surveillance system (DSS) in rural KwaZulu-Natal, South Africa. We explore some of the main factors associated with consistency of parental survival status, and propose a series of alternative methodological approaches to deal with the issues and the best ways to record longitudinal data on orphaning in a community where family residential dispersal is common.

Data: We use data collected since 2000 by the Africa Centre Demographic Information System (ACDIS), an ongoing longitudinal demographic surveillance system consisting of 11,000 households and a population of approximately 90,000 household members.

Results: Our results showed that it was possible to detect inconsistency in the report of parental survival status from year to year. Exploring the consistency of reports over time, our estimates showed that an important proportion of parents reported death the previous year, are reported as alive or with an unknown survival status the following year. The inconsistency in report follows the same trend over time for both unlinked mother and unlinked fathers. However, the inconsistency in reporting parents alive the previous reported dead seems to be slightly higher for fathers than for mothers. Inconsistencies tend to be slightly higher when respondents changed from year to year in reporting a parent alive previously as having died.

Discussion: DSS are a valuable source of information on parental survival and have the advantage that consistencies can be more carefully interrogated.

Introduction

During the past two decades, rural communities in South Africa have experienced a rapid and severe HIV epidemic. The consequences of premature mortality of young adults have reported high orphaning rates (Hosegood et al 2007, Hill et al 2008). Reliable data on the levels and trends of orphaning are needed to monitor the effectiveness of intervention programmes and policies directly or indirectly targeting orphans (Madhavan et al 2014). Orphaning during childhood has been found to be disadvantageously associated with numerous health and welfare outcomes including education (Guo & Sherr 2012), mental health (Cluver et al, 2012; Atwine et al, 2005), and early sexual debut (Operario et al 2011).

The most widely used parental survival data is that available from cross-sectional surveys or censuses. However, in communities in southern Africa where orphaning rates are high (Hosegood et al 2007; Hill et al 2008) and many children are not co-resident with living parents (Hill et al 2008), there are many reasons to anticipate that intentional and unintentional misreporting and bias in cross-sectional surveys may reduce the accuracy of orphanhood estimates. The circumstances in which people misreport a child's parental survival status are not well understood. Explanations hypothesised include stigmatisation, elevated risk of parental union dissolution, out-migration, and tension and conflict in social relationships. Furthermore, children whose parent(s) are dead may be omitted by respondents or excluded by sampling criteria.

The main aim of the paper is to examine the completeness of parental survival status over time using longitudinal data from a demographic surveillance system (DSS) in rural KwaZulu-Natal, South Africa. We explore some of the main factors associated with consistency of parental survival status, and propose a series of alternative methodological approaches to deal with the issue and the best ways to record longitudinal data on orphaning in a community where family residential dispersal is common.

Data and Methods

This paper uses longitudinal demographic surveillance system data collected since 2000 by the Africa Centre Demographic Information System (ACDIS) in 11,000 households and a population of approximately 90,000 household members. The demographic surveillance area (DSA) consists of a geographically contiguous area of 438km² in the Umkhanyakude district, northern KwaZulu-Natal, South Africa. The design of ACDIS has previously been described in detail (Tanser et al, 2008).

In this paper, our main variable of interest is to determine at any given point in time whether the biological parents of a child are alive or dead.

There are two ways to establish the survival status of a child's parent using existing ACDIS data. The first way is to establish parental survival status is by examining any routine prospective observations made of those parents who themselves are a registered individual in the DSS and, for whom linkage with their children has been recorded. For many children, this linkage with one or both biological parents will occur at the time they are registered as new births in the surveillance area. However, the linkage may also be made later in childhood for example, when a child migrates to join a parent who has been living in a different household within the DSA.

Figure 1 present the proportion of children 0-17 years old between 2000-2013 for whom the biological mother or father is known (linked) and registered in the ACDIS. The data is shown by calendar year. There are very marked differences in proportion of children linked to mothers and fathers in ACDIS. The proportion of children linked to their father has been decreasing over time. In 2000, more than half of the children were linked to their father. In 2013, this linkage has dropped to 2 in 5 children. We elaborate on our findings and consider the extent to which this i) reflects further reductions in the overlap between the social and residential environments occupied by fathers and

their biological children, or ii) might be exacerbated by the fixed geographical boundaries of the surveillance area. Children may be connected with their fathers, particularly later in childhood, however, the higher levels of external migration by men than women may mean these connections are made in households outside the surveillance area and thus not observed (recorded).

When a linkage is not recorded, the second way of establishing a child's survival status is from answers given by a household respondent to a direct question about whether a child's biological parent is alive (Hosegood, et al 2007). This question has been asked about each child during the routine household visit since 2004. This data permits the estimation of orphaning for all children regardless of whether the parent is registered or not. However, the use of these repeated observations has challenges. These include missing observations, respondent reporting not knowing whether the child's parent is alive or dead, implausible sequences of status observations such that a parent previously reported to have died is later reported to be alive. We explore these inconsistencies and seek to identify factors associated with the completeness and consistency over time.

Parental Survival Status Prevalence

Orphaning prevalence is the results of both reported parental and maternal survival status at a given point in time. Figure 2 shows that the prevalence of maternal deaths has been stable since 2004. Although the prevalence of HIV in women has increased since the advent of HIV treatment, the stable level of maternal mortality may reflect a compensatory improvement in survival of HIV-infected mothers. Based on child-parent linkage, we see that the mortality prevalence of unlinked mother was reported to be lower compared to that of linked mothers (Figure 2).

In contrast, the considerably higher prevalence of paternal deaths continued to increase up until 2008-9 before declining. In this population, the proportion of paternal mortality at each age is expected to be higher than that of maternal mortality given that fathers are often older than mothers and that men have a higher rate of premature mortality than women, for example, from injuries and accidents (Anupam et al., 2011). The relative delay of paternal mortality that appears to decline may reflect the slower gains in survival of HIV-infected men than women which have been observed in the community (Reneirs et al. 2014). However, the prevalence of paternal deaths for unlinked fathers was reported to be almost twice as high as that of linked fathers.

The completeness of parental survival status

The actual bias in the estimates is related to the reported survival status of those unlinked mother and fathers. Exploring the consistency of reports over time, our estimates showed that an important proportion of unlinked parents reported death the previous year, are reported as alive or with an unknown survival status the following year (0).

The inconsistency in report follows the same trend over time for both unlinked mother and unlinked fathers. However, the inconsistency in reporting parents alive the previous reported dead seems to be slightly higher for fathers than for mothers. The "do not know" category also incorporates an amount of noise. In long periods of absence of the parent, could it be treated as a social death rather than an actual biological death?

Factors affecting completeness of parental survival status

One of the key aspects to obtain the information in ACDIS is the household respondent, i.e. the person in charge of providing the demographic information collected in each round of ACDIS. Household respondents are selected based on the following criteria: they need to be present at the visit,

and they need to be 15 years or older. According to ACDIS, around 50-55% of household respondents do not change from round to round, and for the purpose of our yearly estimates, from year to year. Figure 4 shows that the proportion of consistency from one year to the next, regardless of who this person was, was very similar between different and same household informants for fathers reported to be dead the previous year. The report from a different informant the following year showed slightly higher inconsistencies than the report from same informants the previous year. However, results from Chi2 to test whether there were significant differences between types of respondents in the consistency of reports showed almost no statistically significant differences between changing and keeping the same household respondent the following year.

Which type of respondent is more consistent with their responses throughout time? We found that levels of inconsistent reports from the previous year to the next when respondents were the mother of the child in both years tend to be lower than when the respondent was other than the mother in both years (Figure 5). In addition, the “don't know” category tends to be higher when the respondent is other than the mother.

Concluding Notes

In this paper, we explore factors that might influence the level of completeness and consistency of these data, for example, changes in household respondent, the knowledge of household respondents, understanding and articulation of questions by different fieldworkers, or whether the data provides any insights about the extent to which missing or not known reports are more likely in situations where the parent is separated from the child under difficult circumstances such as divorce or where the household respondent holds negative opinions about the child's parent, what might be termed as a ‘social death’ rather than a ‘physical death’ (Madhavan et al., 2014).

Inconsistencies are notable on the reported timing of death (or whether it happened at all). The consistency of “inconsistencies” suggests that there may be a systemic issue (s) in the way this question is constructed by both interviewer and respondent.

Hence, DSS are a valuable source of information on parental survival and have the advantage that consistencies can be more carefully interrogated.

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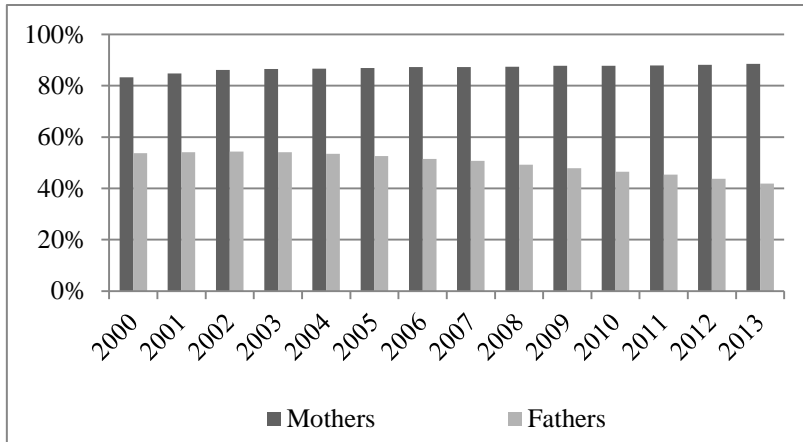
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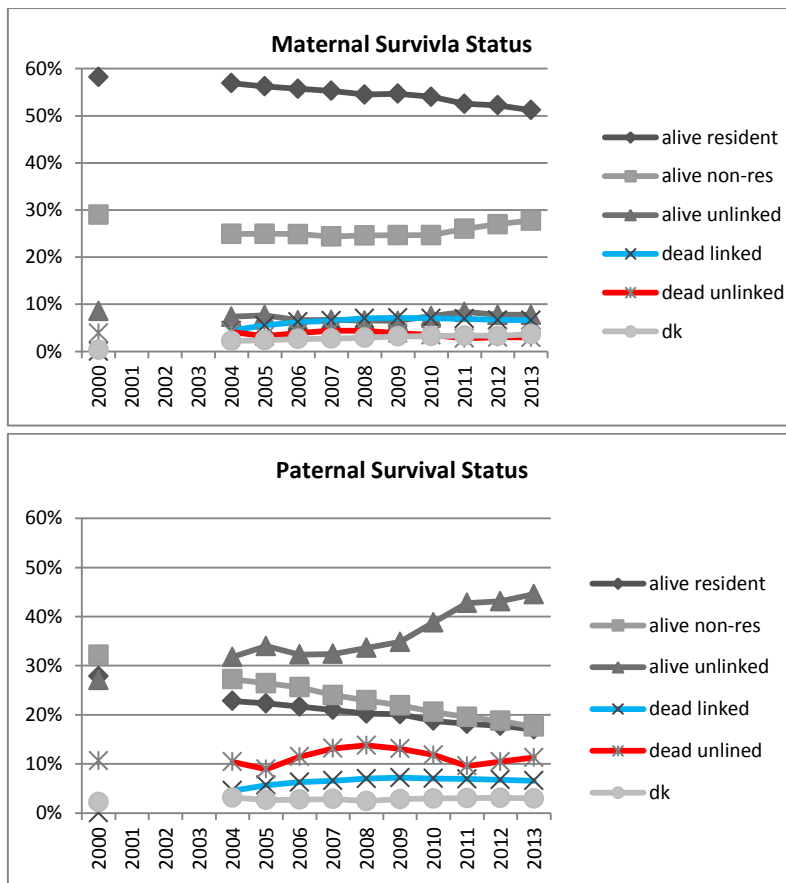
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Figure 1. Linkage between children <18 years and biological parents by calendar year.



Source: Authors' calculations based on ACDIS.

Figure 2. Reported Parental Survival Status, ACDIS 2000-2013.



Source: Authors' calculations based on ACDIS.

Figure 3. Reported Survival Status in year X for Unlinked Fathers reported death in year X-1

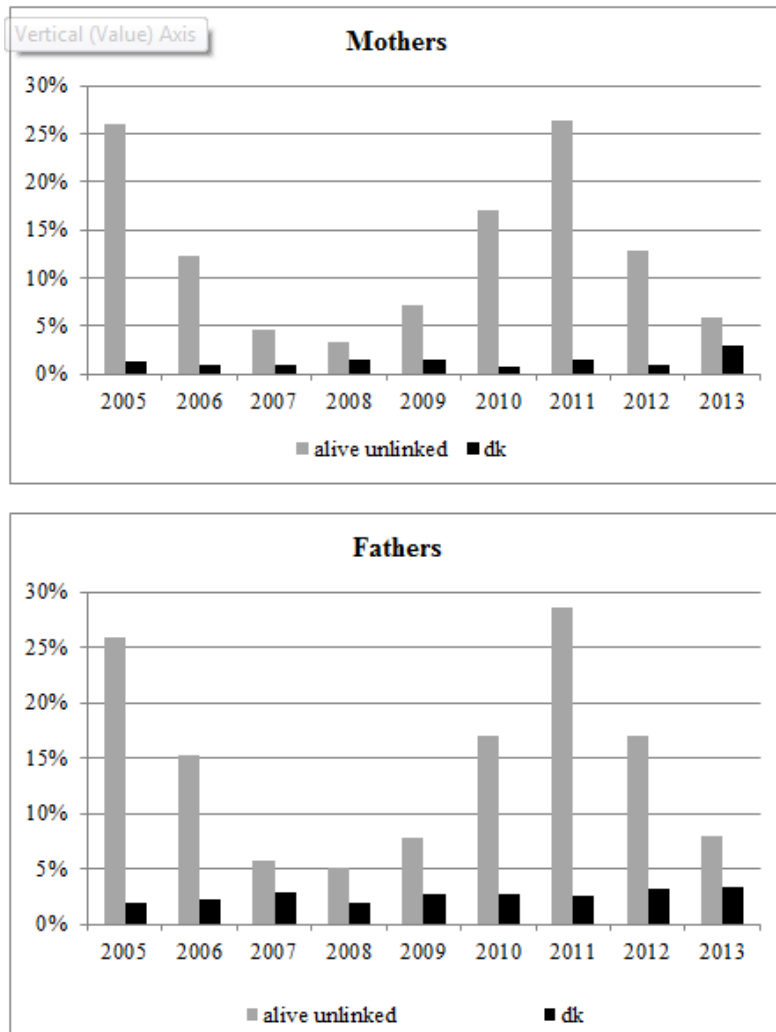


Figure 4. Reported Paternal Survival Status in year X for fathers reported dead in year X-1 by same and different household respondent both years.

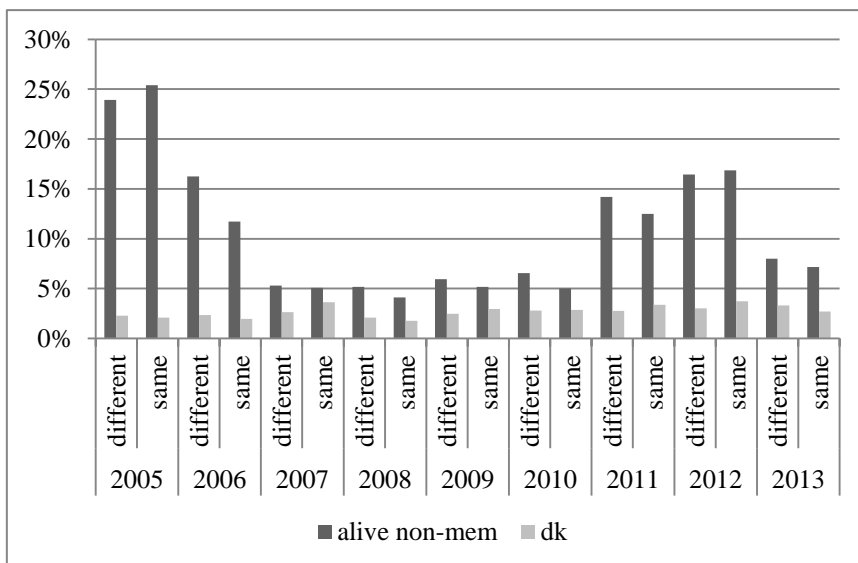
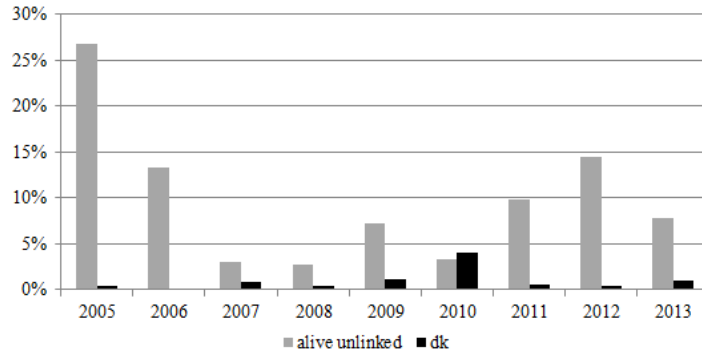
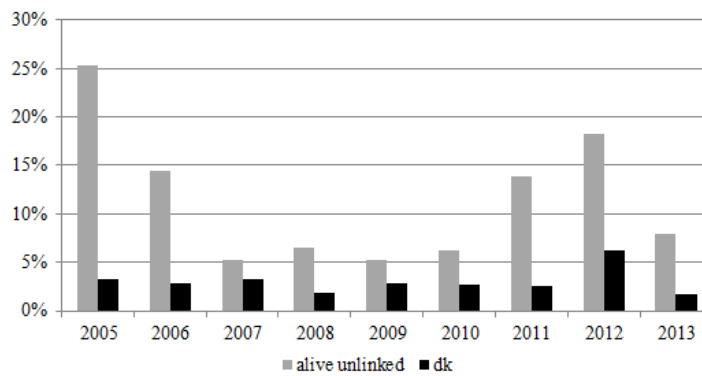


Figure 5. Reported Father Survival Status in year X for Unlinked Fathers reported dead in year X-1

Reported Father status in year X for unlinked fathers reported dead in year X-1 – *mother respondent in both years*



Reported Father status in year X for unlinked fathers reported dead in year X-1 – *maternal grandmother respondent in both years*



Reported Father status in year X for unlinked fathers reported dead in year X-1 – *other hh respondent in both years*

