International estimates on infertility prevalence and treatment seeking: potential need and demand for medical care

Sir,

A recent literature search on infertility prevalence in sub-Saharan Africa brought the article entitled ‘International estimates on infertility prevalence and treatment seeking: potential need and demand for medical care’ to my attention (Boivin et al., 2007). The article was published under ‘New Debate’ in this journal. Following a literature review of population based studies, the authors concluded that the 12-month infertility prevalence did not differ between more and less developed countries with an estimated overall median prevalence of 9%. Perhaps surprisingly, no debate followed at the time of publication. Although I congratulate the authors on addressing an important issue relating to global reproductive health, I wish to question the validity of the above conclusion. I believe that there are shortcomings in the underlying analysis relating to a misinterpretation of original data, the omission of relevant studies and the extrapolation of data which may not be representative across regions.

The authors identified 28 population surveys evaluating infertility prevalence. The estimate of 12-month infertility prevalence was based only on those studies reporting current infertility, which included six reports from more developed countries and three reports from less developed countries. Among the former, five studies reported a 12-month infertility prevalence (range: 3.5–16.7%), and one study reported a 24-month infertility prevalence (7%). It would appear that in the calculation of the median 12-month infertility prevalence in more developed countries the latter study was excluded, although this is not clearly stated in the manuscript. My concerns, however, relate to the analysis and interpretation of data from less developed countries. The median 12-month infertility prevalence was derived from three studies conducted in the Gambia, Tanzania and China (Sundby et al., 1998; Che and Cleland, 2002; Larsen, 2005). Two of these studies did, however, not measure 12-month infertility. Larsen (2005) used a 24-month period to determine both primary and secondary infertility, and Sundby et al. (1998) used a period of 12 months only as a measure of primary infertility, although a 3 year period was applied to define secondary infertility. The conclusion of Boivin and her co-authors that the median 12-month infertility prevalence in less developed countries is 9% is therefore based on three studies, of which two did not measure the outcome in question. Evidently, the assessment of non-conception over periods longer than 12 months will be associated with a lower infertility prevalence. The calculated 9% prevalence rate is therefore likely to be an underestimate.

In addition, two relevant publications were omitted. Adetoro and Ebomoyi (1991) reported an 18-month infertility prevalence of 30.3% among women living in Nigeria. Working in Gabon, Schrijvers et al. (1991) documented an infertility prevalence of 25.5% using a 2 and 3 year period to define primary and secondary infertility, respectively. Although neither of these two studies reported the outcome in question (12-month current infertility), the applied definitions fall within the range used by Larsen (2005) and Sundby et al. (1998). As such they should have been considered in the manuscript. Also of interest must be the DHS Comparative Report No.9: Fertility, Infertility and Childlessness in Developing Countries by Rutstein and Shah (2004). This report provides the most recent and comprehensive information on infertility prevalence in four developing regions (sub-Saharan Africa, North Africa/West Asia, Central Asia/South and Southeast Asia, Latin America/Caribbean). Based on DHS data collected between 1995 and 2000, the estimated prevalence of primary infertility in women age 25–49 was between 1.5 and 2.9%. Secondary infertility ranged from 12.7 to 30.2%, with the highest rates recorded in sub-Saharan Africa. Although these data are not comparable with the above studies due to differences in the measure of infertility, they provide relevant insights into global infertility prevalence which should not be overlooked.

My last concern relates to the extrapolation of data. It is questionable whether data derived from three studies can be considered representative of the rest of the developing world. Furthermore, it must be noted that in the study conducted in China estimates of infertility referred exclusively to primary infertility (Che and Cleland, 2002). The authors stated that in China few couples have more than one child, and secondary infertility is therefore of limited interest. The context of infertility in China is entirely different from the context of infertility in sub-Saharan Africa, where couples frequently desire many children and where the dominant infertility problem is secondary infertility (Cates et al., 1985; Larsen, 2000). Combining data from these two regions in order to calculate a single median estimate of infertility prevalence would appear inappropriate unless considerable emphasis is placed on the heterogeneity of data, in order to avoid incorrect conclusions.

In summary, data on infertility prevalence in less developed countries are lacking. Moreover, comparability of existing data is limited due to differences in definitions, outcome measures, research settings and socio-cultural backgrounds. Against this backdrop, the attempt to calculate a single median estimate of infertility prevalence is fraught with difficulties and may be misleading.

References

Reply: International estimates on infertility prevalence and treatment seeking: potential need and demand for medical care

Sir,

We welcome the in-depth attention Dyer gave our article on the international prevalence of infertility. Dyer questioned the validity of our conclusion on the basis of misinterpretation of original data, omission of relevant studies and extrapolation of data that was not representative across regions.

In our study, we identified 25 population surveys evaluating infertility prevalence and reported the current median 12-month infertility prevalence to be 9% for more (3.5–16.7%) and less developed (9.2–9.3%) countries excluding studies using a 24 month period. Although this exclusion was made clear in the Results we did not re-iterate it in the Discussion or the Abstract and we agree with Dyer that this omission might have led to confusion about the pool of studies that were used to generate our median prevalence. It is of interest that where 12 and 24 month estimates were available from the same study, the difference was not large (8.5 and 7%, respectively) (Royal Commission, 1993).

The prevalence of 9% for the less developed countries was also queried in respect to the inclusion of three studies conducted in the Gambia, Tanzania and China (Sundby et al., 1998; Che and Cleland, 2002; Larsen, 2005). Dyer states that two of these studies did not measure 12-month infertility (Larsen and Sundby). In the original Table I we did indicate that the Larsen study used a 24 month prevalence rate and that study was excluded from our calculation of the median prevalence (see p. 1508 of our article). As noted by Dyer, Sundby examined separately current primary infertility of at least 1 year (3.2%, p. 894 her article) and secondary infertility (6%, p. 894) for a 3 year period and we used her summative value (9.2%) in our current estimate when we should have used only the current primary infertility value.

Dyer also draws our attention to other relevant publications omitted from our review: the publication by Adetoro and Ebomoyi (1991) reporting prevalence in Nigeria and the work in Gabon by Schrijvers et al. (1991). The Demographic and Health Surveys Comparative Report (Rutstein and Shah, 2004) was examined and we excluded it because much of the Larsen (2000) and Ericksen and Brunette (1996) paper on prevalence in Sub-Saharan Africa are based on the DHS data and we wanted to avoid duplication in our reporting. We concur however that as the Rutstein and Shah report is more comprehensive we should have used this one (excluding the China estimate due to single child policies). Since publication of our article we also obtained another study on current infertility in Iran (Ahmadi Asr Badr et al., 2006) and found additional data embedded in Fuentes and Devoto (1994) on current infertility in Chile.

Given the letter from Dyer and correspondence from other readers, we believe presentation of the overall and separate (primary and secondary) prevalence rates would be a useful update of our original article (see updated Table I). Only 63.0% (n = 17) provided separate estimates and four studies (van Balen et al., 1997; Zargar et al., 1997; Che and Cleland, 2002; Liu et al., 2005) only examined primary infertility. In most studies (78%) primary infertility was defined as no history of previous pregnancy and secondary infertility as a history of at least one previous pregnancy before the period of infertility. The remaining studies used a history/no history of live birth.

In updated Table I the current median 12-month infertility prevalence for more developed countries remains the same (n = 5, 9% median, 3.5–16.7% range) but is slightly lower in less developed countries about 6% (n = 4, 3.2–9.3% range). However, the main revelation from Table I is that presentation of an overall prevalence rate masks underlying differences between more and less developed countries in primary and secondary estimates that when combined give the impression of similarity. In reality the data suggest that women in more developed countries have higher rates of primary infertility compared with women in less developed countries (7.7 versus 4.5%, respectively) whereas the reverse is true with secondary infertility which is higher in women from less developed countries (8.5 versus 13.4%, respectively).

We agree with Dyer that it is difficult to make cross country comparisons because of significant conceptual and methodological heterogeneity. Indeed researchers use different definitions of infertility (subfertility, infecundity, primary, secondary, no live birth versus no conception, varying periods of post-marital childlessness) and different denominator populations (e.g. ‘at risk of pregnancy’/exposed populations versus no use of contraception, versus married versus all