 doi:10.1093/humrep/den218

# Documentation of infertility prevalence, treatment access and treatment outcomes in developing countries

**Karl Nygren[1,3] and Fernando Zegers-Hochschild[2]**

[1]*Queen Sophia Hospital, Stockholm, Sweden;* [2]*Clinicas Las Condes, Santiago, Chile*

[3]Correspondence address. E-mail: karl-gosta.nygren@telia.com



## Background and current knowledge

To set up adequate fertility services in a country, a national evaluation of the *basic need* of such services is desirable, i.e. an evaluation of the national prevalence of infertility. The reason is that the prevalence of infertility varies between countries mainly due to variations in lifestyle factors causing or contributing to the infertility status, dominantly the time interval between the age where sexuality is initiated and the age where first pregnancy is desired, and of course, the prevalence of sexually transmitted diseases (STDs). In urban communities, women tend to seek fertility treatment too late in their reproductive life and with difficult access to appropriate diagnostic and therapeutic facilities. The actual 'demand' for medical services and the obstacles encountered in seeking treatments vary considerably between countries, mainly due to wide differences in financial resources and in the recognition of infertility as a public health issue, with the corresponding absence of specific public health policies.

### *Prevalence of infertility: potential need for treatment*

A recent overview (Boivin *et al.*, 2007) of population based surveys, published since 1990, estimated the current international prevalence of infertility to be 9% in average, with a range of 3.5–16.7% (Table 1). The Table is taken from that overview, showing current infertility prevalence from a number of less developed countries. The life-time prevalence was found to range from 5.0% to 25.7%. There was a wider range in developing countries, possibly due to different country specific factors, such as the prevalence of STDs (which *per se* shows important variation over time, in developed as well as in developing countries), age at delivery, political factors (e.g. the one-child family policy in China) and more.

Hence, estimations of the prevalence of infertility tend to be national and time specific. An even more complex issue is to try to associate prevalence of infertility with its significance to a certain country or region. For example, a prevalence of 9% infertility in a community where the mean age of female is near 40 (Germany) is different to countries where the same prevalence stands in a population of mean age 24 (Brazil). Social and demographic impacts are different in these two examples; therefore, the application of public health policies will necessarily consider other factors beyond prevalence before public funding is diverted to the establishment infertility services.

### *Treatment demand: seeking-treatment behaviour and obstacles*

In the same overview of population-based surveys, the average tendency to seek medical help was estimated to be 56%, with relative little variation between countries.

However, obstacles to treatment seeking were possibly very different in different settings, again country and time specific. Although for some communities infertility is a curse from God and should be accepted without discussion, for others infertility is a health problem needing treatment as any other health issue. The proportion of infertile women seeking medical treatment will also vary depending on the availability and access to appropriate diagnostic and therapeutic alternatives. Many women prefer to remain infertile (especially when it is a secondary infertility) if they have to travel long distances to seek therapy, when their husband have expressed no interest or when other neighbours have spent months with no solution to their problem.

### *Actual treatment access*

International variation in access to the treatment of assisted reproduction technologies (ART) and of intrauterine insemination treatments (IUI) has been recorded and published annually from a number of countries, mostly from developed countries but in an increasing number also from developing countries.

The International Committee of Monitoring of ART (ICMART) in its latest World Report (Adamson *et al.*, 2006) from treatments started during 2002 and covering 1.429 clinics in 49 countries reported an access ranging from very low levels in most developing countries (60–200) up to over 2000 treatment cycles per million inhabitants in Denmark, and possibly even higher in Israel.

It is clear that access is determined first of all by financial resources, public or private, and by legal regulation.

Cross-border fertility care occurs as a result of this inequity of access; however, in the majority of cases, cross-border

**Table 1:** Potential need for medical care (prevalence of infertility) in less developed countries (with kind permission of Boivin *et al.*, 2007).

| Authors | Country or region | Year of survey | Women sampled | Age of survey sample | Reproductive state defined | Time to state (months) | Period covered by survey | Population sample size | Percent infertile |
|---|---|---|---|---|---|---|---|---|---|
| Less developed countries | | | | | | | | | |
| *Current* | | | | | | | | | |
| Che and Cleland (2002) | China | 1988–1995 | Newly married | 25–45 | Infertility[a] | 12 | Current | 7872 | 9.3 |
| Larsen (2005) | Northern Tanzania | 2003 | All | 20–44 | Infertility | 24 | Current | 2019 | 6.9 |
| Sundby *et al.* (1998) | Gambia | 1994 | Married | 15–49 | Infertility | 12 | Current | 2918 | 9.2 |
| *Lifetime* | | | | | | | | | |
| Barden-O'Fallon (2005) | Rural Malawi | 2000–2002 | All | 15–34 | Infertility | 12 | Lifetime | 678 | 19.6 |
| Fuentes and Devoto (1994) | Santiago, Chile | 1993 | Married | 15–45 | Infertility | 12 | Lifetime | 474 | 25.7 |
| Geelhoed *et al.* (2002) | Rural Ghana | 1999 | All | 15–44 | Infertility | 12 | Lifetime | 1073 | 11.8 |
| Unisa (1999) | India (Pradesh) | 1998 | Married $\geq$3 years | 20–49 | Childlessness | 36 | Lifetime | 6640 | 5 |
| Zarger *et al.* (1997) | Indian Kashmir | 1997 | Married $\geq$1 year | 15–44 | Infertility[b] | 12 | Lifetime | 10 063 | 15.1 |
| Che and Cleland (2002) | Shanghai, China | 1988–1995 | Newly married | 25–45 | Infertility[b] | 24 | First 5 years | 7872 | 3 |
| Ericksen and Brunette (1996)[a] | Sub-Saharan Africa | 1977–1992 | Newly married | 20–41 | Childlessness | 60 | First 5 years | WFS and DHS | 14.5 |
| Larsen (2000) | Sub-Saharan Africa | 1977–1997 | Newly married | 20–44 | Childlessness | 60 | First 7 years | 66 453 | 16.4 |
| Liu *et al.* (2005) | China (national) | 2005 | Newly married | 15–57 | Childlessness | 84 | First 7 years | 21 970<br>120 160 | 1.3 |

[a]DHS, Demographic and Health Surveys; WFS, World Fertility Survey; Lifetime: in pre-menopausal women this means lifetime to date of interview.
[b]Primary infertility only.

reproductive care is reachable only by those who can afford travelling, out of pocket funding of treatment. The magnitude and reasons for this phenomenon is currently under international evaluation.

## What further national documentation is needed?

Most countries have very little access to national data. Data are country and time specific. Ideally, in order to transfer limited economic resources into sexual and reproductive healthcare, data on prevalence of infertility and on certain etiologic factors are required. However, hard data are difficult to obtain, and many times, health policies are established in the absence of epidemiologic data. The same applies for the evaluation of therapeutic interventions. What has proved to be useful is the access to international or regional data as a source of external quality control in order to build-up and maintain confidence on infertility treatments among couples, professionals and society at large.

Therefore, an international effort of co-operation in this area is suggested.

### *A draft strategic template*

Before promoting infertility treatment services in a developing country, and indeed in any country, an understanding is needed of the country-specific magnitude and character of the problem, as well as of already existing national resources, so that the national 'resource gap' can be identified.

When an intervention starts, ideally based on these assessments, a system of monitoring treatment characteristics and outcomes should already be in place. For this purpose, common definitions and terminology and national key data for collection need to be identified. ICMART has published an infertility glossary, endorsed by all the large international professional organisations (Zegers-Hochschild *et al.*, 2006a,b). ICMART and WHO will hold an international conference to revise and expand this glossary, late 2008.

In the first phase, before interventions, a specific 'country profile' on infertility should be prepared, based on a 'needs assessment and a resources assessment' resulting in 'a national strategy plan'.

The needs assessment should include an evaluation of the national prevalence of infertility, its country specific causes, obstacles to seeking treatment and current treatment access.

The resources assessment should document national financial and organizational resources. The national strategic plan should be published, its feasibility evaluated and interventions started.

In the second interventional phase, national data collection of key data should be implemented already from the start. Data should be audited and published on a yearly basis. International co-operation on data collection should be in place.

ICMART has developed forms that allow each country to analyse its own data and at the same time, compare their results with the rest of the world. ICMART can assist in establishing alliances with already existing regional registries and with the co-operative IVF World Reports system.

Monitoring of service activities and benefit outcomes will give feedback to clinics for clinical and laboratory policy adjustments, information to couples on clinic performance and information to society for the formulation of regulations and for resources allocation.

National and international comparison is made possible. Confidence can then be built and maintained.

## References

Boivin J, Bunting L, Collins JA, Nygren KG. International estimates of infertility prevalence and treatment-seeking: potential need and demand for infertility medical care. *Hum Reprod* 2007;**22**:1506–1512.

Adamson GD, de Mouzon J, Lancaster P, Nygren KG, Sullivan E, Zegers-Hochschild F. World collaborative report on in vitro fertilization, 2002. *Fertil Steril* 2006;**85**:1586–1622.

Zegers-Hochschild F, Nygren KG, Adamson DG, de Mouzon J, Mansour R, Sullivan E. The ICMART glossary on ART terminology. *Hum Reprod* 2006a;**21**:1968–1970.

Zegers-Hochschild F, Nygren KG, Adamson DG, de Mouzon J, Lancaster P, Mansour R, Sullivan E. International Committee monitoring assisted reproductive technologies. *Fertil Steril* 2006b;**86**:16–19.