HHS Public Access

Author manuscript

J Womens Health (Larchmt). Author manuscript; available in PMC 2019 February 07.

Published in final edited form as:

J Womens Health (Larchmt). 2015 July ; 24(7): 541–543. doi:10.1089/jwh.2015.5399.

Measuring Infertility: Searching for Consensus

Marie Thoma, PhD, MHS

Division of Vital Statistics, National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, Maryland

INFERTILITY AND ITS TREATMENT have implications beyond just pregnancy (or its absence), including financial, psychological, and health consequences.[1–5] Ensuring the magnitude of infertility is accurately defined at the national and state levels is essential for understanding population trends, improving prevention programs, and providing access to quality care and services. Currently, states do not collect routine data on infertility. The National Survey of Family Growth (NSFG) publishes estimates of current infertility and impaired fecundity for the United States,[6] but these data are not designed to examine state-level differences. A further challenge is the lack of consensus on a standard approach for monitoring infertility.[7] In this context, the article by Crawford et al.[8] in this edition of the *Journal and Women's Health* provides an important contribution to our understanding of state-specific prevalence of lifetime infertility, its treatment, and potential factors to consider for future infertility surveillance efforts.

Measurement of infertility and consensus regarding its definition have been a subject of much ongoing debate. Infertility, whether current or lifetime, has not been defined consistently across studies,[7] hindering the ability to understand the magnitude of the problem and make meaningful comparisons across populations. Assumptions regarding the population at risk of infertility (i.e., the denominator) can also impact estimation,[7,9,10] even when similar definitions for infertility are applied. This affects population-based surveillance of infertility, which should have consistent definitions with which to compare across geographic regions and over time and reliable survey instruments to capture similar at-risk populations.

The major contribution of the Crawford et al. study,[8] and the main focus of this commentary, is in the estimation of lifetime infertility prevalence and comparison of survey instruments among states using data from the 2012 Behavioral Risk Factor Surveillance System (BRFSS). Three of the States Monitoring Assisted Reproductive Technology Collaborative states (Florida, Massachusetts, and Michigan)[11] that added optional state-constructed questions on lifetime infertility and infertility treatment to the core set of BRFSS questions were examined. The questions and responses used to ascertain infertility differed across states, but the authors were able to define infertility similarly as "the inability to become pregnant after having ever tried for 12 months or longer" in their analyses. Lifetime infertility prevalence was estimated separately for all eligible respondents (male and female)

Address correspondence to: Marie Thoma, PhD, MHS, Division of Vital Statistics, National Center for Health Statistics, Centers for Disease Control and Prevention, Reproductive Statistics Branch, 3311 Toledo Road, Hyattsville, MD 20782, MThoma@cdc.gov.

aged 18–50 years and for respondents who had ever tried to get pregnant. Regardless of trying status, the prevalence of lifetime infertility was 9.7%, 6.0%, and 4.2% for Florida, Massachusetts, and Michigan, respectively. Lifetime infertility prevalence increased in each respective state to 25.3%, 9.9%, and 5.8%, most notably for Florida, after restricting the analysis to respondents who had ever tried to get pregnant. Age adjustment had little impact on the overall estimates (data were not shown). In addition, no consistent pattern of characteristics related to lifetime infertility across states was found. In light of these findings, how can we best interpret these differences, particularly the substantially higher prevalence observed for Florida? Are these differences real or do they reflect the use of different collection tools?

The authors examined several possible factors to better elucidate this question, including population characteristics, survey design, and survey instruments. In general, differences in the population characteristics, particularly the presence of an older married population in Florida among respondents who had ever tried to become pregnant, were consistent with a higher prevalence of infertility in this state. However, it was difficult to determine the impact these characteristics had on state differences in infertility without multivariate analyses, which were not conducted due to the small sample sizes. One of the main differences across states was in the construction of the questions used to assess “ever tried to get pregnant” and lifetime infertility. The authors concluded that the results “suggest that structural differences in questionnaires such as how trying to get pregnant and infertility are included…may affect survey estimates.” The analyses presented lend support for this conclusion; however, it was more of a “diagnosis of exclusion” of other factors rather than an explicit validation of the question and item responses across each of the states. An examination of the questions outlined in Table 1 of Crawford et al. (p. 580)[8] showed that Massachusetts and Michigan combined two concepts—having ever tried to become pregnant and infertility/pregnancy loss—into a single question, whereas Florida asked these questions separately. This suggests that infertility estimates may be sensitive to variations in questionnaire wording and structure, despite using a similar definition. While it is difficult to say definitively which approach may be preferable for future studies, the value in their analyses lies in highlighting multiple factors for researchers to consider when designing questions to assess infertility prevalence.

So what can we learn from the Crawford et al. study,[8] and others, that can be applied to future state-based surveillance efforts for monitoring infertility? Key considerations for infertility surveillance efforts are questions that are simple, easy to understand, and can be implemented into existing and future population-based surveys with limited impact on interview length. This also requires a standard set of questions to derive infertility measures. These measures should capture both lifetime infertility prevalence, as examined in this study, and current infertility prevalence. As noted by the authors, current infertility may better capture the present need for infertility programs and services among states.

Their article incorporated a number of approaches that would be useful for these efforts. Infertility is a couple-based condition, and both male and females respondents were queried in the study. Many population-based studies rely solely on female respondents; however, males also experience infertility,[12] have been shown to report this information reliably,[13] and

serve as better sources for their own reproductive history than female proxies.[14] In addition, their approach used questions on infertility that were based on having ever been with a spouse or partner, rather than just married or ever married respondents. Given the increasing trend in cohabitation[15] and births to cohabiting parents,[16] marital status is becoming less of a proxy for childbearing intentions. Finally, they examined the impact of trying status on their estimates. Several studies have examined this issue with differing conclusions depending on research intent. For demographic purposes, Larsen recommended infertility measures take into account whether a respondent was trying to conceive.[17] However, this can be problematic when trying to measure infertility among current pregnancy attempts, since some respondents may have given up trying (due to the inability to conceive)[18] or are ambivalent about future pregnancy intentions.[19,20] Questions regarding future childbearing intentions, as are included in NSFG, may be one approach for addressing respondents who are ambivalent about trying for pregnancy. A final consideration is the duration of 12 months used to define infertility. As mentioned by Crawford et al., this criterion may not be relevant for certain populations. For comparability, a standard definition is needed. Studies that have queried respondents on their duration of pregnancy attempt (or duration of unprotected intercourse) were able to apply a standard 12-month definition, but could also vary this criterion if needed. For example, to estimate a prevalence based on 24 months of trying, which has been used in other demographic surveys.[17] These considerations and complexities in measuring infertility will need to be balanced with the need for straightforward and consistent questions for population surveillance.

Addressing risk factors and consequences of infertility requires a comprehensive public health framework, the first of which is to develop accurate population-based estimates of infertility. The Centers for Disease Control and Prevention's recently released National Public Health Action Plan for the Detection, Prevention, and Management of Infertility outlines a number of research priorities and data sources that can be used to address these priorities.[21,22] The action plan highlights the need for comparable population-based data on infertility prevalence and information on associated risk factors, outcomes, and subpopulations, such as people with cancer or others who might benefit from fertility preservation. While various approaches for estimating infertility have their pros and cons, agreement on definition and instruments used to assess this important condition are needed to make meaningful comparisons across populations and over time.

References

1. Peterson BD, Sejbaek CS, Pirritano M, Schmidt L. Aresevere depressive symptoms associated with infertility-related distress in individuals and their partners? Hum Reprod 2014;29:76–82. [PubMed: 24256990]
2. Pandey S, McLernon DJ, Scotland G, Mollison J, Wordsworth S, Bhattacharya S. Cost of fertility treatment and live birth outcome in women of different ages and BMI. Hum Reprod 2014;29:2199–2211. [PubMed: 25061026]
3. Raatikainen K, Harju M, Hippelainen M, Heinonen S. Prolonged time to pregnancy is associated with a greater risk of adverse outcomes. Fertil Steril 2010;94:1148–1151. [PubMed: 20004381]
4. Basso O, Weinberg CR, Baird DD, Wilcox AJ, Olsen J. Subfecundity as a correlate of preeclampsia: A study within the Danish National Birth Cohort. Am J Epidemiol 2003; 157:195–202. [PubMed: 12543618]

5. Macaluso M, Wright-Schnapp TJ, Chandra A, et al. A public health focus on infertility prevention, detection, and management. Fertil Steril 2010;93:16–10. [PubMed: 18992879]
6. Chandra A, Copen CE, Stephen EH. Infertility and impaired fecundity in the United States, 1982–2010: Data from the National Survey of Family Growth. Natl Health Stat Report 2013;1–18.
7. Gurunath S, Pandian Z, Anderson RA, Bhattacharya S. Defining infertility—A systematic review of prevalence studies. Hum Reprod Update 2011;17:575–588. [PubMed: 21493634]
8. Crawford S, Fussman C, Bailey M et al. Estimates of lifetime infertility from three states: The Behavioral Risk Factor Surveillance System. J Womens Health 2015;24: 578–586.
9. Thoma ME, McLain AC, Louis JF et al. Prevalence of inferitlity in the United States as estimated by the current duration approach and a traditional constructed approach. Fertil Steril 2013;99:1324–1331.e1. [PubMed: 23290741]
10. Guzick DS, Swan S. The decline of infertility: Apparent or real? Fertil Steril 2006;86:524–526. [PubMed: 16952501]
11. Mneimneh AS, Boulet SL, Sunderam S, et al. States Monitoring Assisted Reproductive Technology (SMART) Collaborative: Data collection, linkage, dissemination, and use. J Womens Health (Larchmt) 2013;22:571–577. [PubMed: 23829183]
12. Louis JF, Thoma ME, Sorensen DN et al. The prevalence of couple infertility in the United States from a male perspective: Evidence from a nationally representative sample. Andrology 2013;1:741–748. [PubMed: 23843214]
13. Nguyen RH, Baird DD. Accuracy of men's recall of their partner's time to pregnancy. Epidemiology 2005;16:694–698. [PubMed: 16135949]
14. Martinez GM, Chandra A, Abma JC, Jones J, Mosher WD. Fertility, contraception, and fatherhood: Data on men and women from cycle 6 (2002) of the 2002 National Survey of Family Growth. Vital Health Stat 23 2006;1–142.
15. Copen CE, Daniels K, Vespa J, Mosher WD. First marriages in the United States: Data from the 2006–2010 National Survey of Family Growth. Natl Health Stat Report 2012;1–21.
16. Curtin SC, Ventura SJ, Martinez GM. Recent declines in nonmarital childbearing in the United States. NCHS Data Brief 2014;1–8.
17. Larsen U Research on infertility: Which definition should we use? Fertil Steril 2005;83:846–852. [PubMed: 15820788]
18. Slama R, Ducot B, Carstensen L et al. Feasibility of the current-duration approach to studying human fecundity. Epidemiology 2006;17:440–449. [PubMed: 16755258]
19. Greil AL, McQuillan J, Johnson K, Slauson-Blevins K, Shreffler KM. The hidden infertile: Infertile women without pregnancy intent in the United States. Fertil Steril 2010;93:2080–2083. [PubMed: 19782354]
20. Greil AL, McQuillan J. "Trying" times: Medicalization, intent, and ambiguity in the definition of infertility. Med Anthropol Q 2010;24:137–156. [PubMed: 20550090]
21. Centers for Disease Control and Prevention. National public health action plan for the detection, prevention, and management of infertility. Atlanta, GA: Centers for Disease Control and Prevention, 2014.
22. Warner L, Jamieson DJ, Barfield WD. CDC releases a national public health action plan for the detection, prevention, and management of infertility. J Womens Health 2015;24:548–549.