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SKEWED CONTRACEPTIVE METHOD MIX: WHY IT HAPPENS, WHY IT MATTERS

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Summary. Contraceptive prevalence has been central to family planning research over the past few decades, but researchers have given surprisingly little consideration to method mix, a proxy for method availability or choice. There is no 'ideal' method mix recognized by the international community; however, there may be reason for concern when one or two methods predominate in a given country. In this article method skew is operationally defined as a single method constituting 50% or more of contraceptive use in a given country. Of 96 countries examined in this analysis, 34 have this type of skewed method mix. These 34 countries cluster in three groups: (1) sixteen countries in which traditional methods dominate, most of which are in sub-Saharan Africa; (2) four countries in which female sterilization predominates (India, Brazil, Dominican Republic and Panama); and (3) fourteen countries that rely on a single reversible method (the pill in Algeria, Kuwait, Liberia, Morocco, Sudan and Zimbabwe; the IUD in Cuba, Egypt, Kazakhstan, Kyrgyz Republic, Moldova, Turkmenistan and Uzbekistan; and the injectable in Malawi). A review of available literature on method choice in these countries provides substantial insight into the different patterns of method skew. Method skew in some countries reflects cultural preferences or social norms. Yet it becomes problematic if it stems from restrictive population policies, lack of access to a broad range of methods, or provider bias.

Introduction

Almost all countries in the world offer family planning clients a range of contraceptive methods. 'Method mix' refers to the distribution of contraceptive methods used by a population (i.e. the percentage that uses each method). There is no 'optimal' or 'ideal' method mix recognized as such by the international reproductive health community. Indeed, conventional wisdom holds that there is no single 'best' contraceptive; rather, couples are encouraged to adopt the method with the most benefits and the fewest

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drawbacks or side-effects. However, there is often concern at the international level when a single method predominates in a country, suggesting some systematic limitation of contraceptive choice.

On a global basis, the most widely used contraceptive methods are female sterilization, the pill and the IUD (Robey *et al.*, 1992; Ross *et al.*, 1999). However, the method preferences of a given country may deviate from this. For example, sterilization is not widely accepted in many Muslim countries, even those considered success stories for family planning, such as Indonesia and Morocco. By contrast, it is a vastly popular method in many Latin American countries where the small family norm is widely embraced and women marrying at a fairly young age seek a long-term solution to pregnancy prevention. As for reversible methods, the pill or the IUD often occupies the top position, with many countries showing strong preference for one over the other. Depo-Provera, a three-month injectable, was relatively under-utilized until the early 1990s, when approval by the FDA (US Food and Drug Administration) created a climate for greater acceptance worldwide. Studies conducted prior to 2000 show that Depo-Provera use is on the rise, though not yet among the top three methods worldwide (sterilization, IUD and the pill).

Whereas contraceptive prevalence has been a central focus of family planning research over the past two decades, surprisingly little attention has been paid to method mix. A few exceptions include the methodology for determining a client-oriented method mix developed by Galway & Stover (1995), which builds on the earlier work by Choe & Bulatao (1992) to identify an 'appropriate method mix', and more recent work on the prospects for future trends in contraceptive use. The latter explores what the contraceptive needs of future generations will be, given the current distribution in method preference and possible changes in future years (Ross *et al.*, 1999; UNFPA, 1999; Bongaarts & Johansson, 2002). Bongaarts & Johansson (2002) predict that as quality of services improve, as markets for contraceptives become more open, and as levels of contraceptive knowledge and education rise, one should expect a great variety of contraceptives in use and a more balanced distribution among different modern methods.

Nonetheless, method mix has important programmatic implications. Historically, some programmes have emphasized certain methods over others; however, the ideal is to offer a balance of methods. During the 1980s and early 1990s, many countries explicitly promoted methods that they considered under-utilized – often long-term methods (both for their effectiveness as well as convenience to users). However, in the wake of the International Conference on Population and Development held in Cairo in 1994, many programmes have tried to provide a broad range of methods, and they strive to give clients the method that they ask for, assuming no medical contraindications.

Contraceptive method mix is influenced by a number of issues. Bulatao (1989) identified four factors: contraceptive goals, contraceptive competence, contraceptive evaluation and contraceptive access. This framework emphasizes the individual and aims at developing a better understanding of personal choices for particular contraceptive methods. Others have focused on the characteristics of contraceptive methods with the aim of developing improved methods (Bulatao, 1989). In this paper, where method skew is defined as a single method that 'dominates' the method mix,

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Table 1. Possible reasons for contraceptive method skew

Policies and programmes:
Government promotion for certain methods at the expense of others (targets, campaigns etc.)
Regulatory barriers (e.g. Depo-Provera, sterilization)
Capability and motivation to mount programmes to provide range of methods
Variety of factors affecting access within service sites (service guidelines, organization of work, etc.)
Provider bias:
Provider preferences for specific methods (what's 'best' for the client and/or easiest for the provider)
History:
Length of time since introduction of each method in the country (or geographical area)
Widespread availability leading to familiarity and acceptance among clients, providers and community
Properties of the methods themselves:
Cumulative effect of higher continuation rates for longer-term methods
Ease of distribution of 'non-clinical' methods (through social marketing or community-based distribution)
High programme costs for some methods (e.g. Norplant)
Other method attributes affecting popularity (cost, effectiveness, side-effects, ease of use, etc.)
Client characteristics:
Knowledge of alternative contraceptive methods
Desire for limiting vs spacing
Religious beliefs
Personal preferences, often influenced by the cultural context
Age/life stage

the authors explore supply and demand factors that contribute to skew. Specifically, five possible reasons for method skew are considered: policies and programmes, provider bias, history, properties of the methods themselves, and client characteristics (see Table 1). Of these five, the first two are of greatest concern, because they reflect the supply environment and suggest constraints to choice.

Given the concern surrounding skewed contraceptive method mix, this paper identifies countries with the most strongly skewed method mix and explores the factors that explain this skew. It also examines the use of a cut point measure of method skew to flag a lack of contraceptive options.

Defining and measuring method skew

In this analysis, currently married women who reported using contraception were classified by method into one of seven possible categories: female sterilization, vasectomy, the pill, injectable, IUD, condoms/other barrier methods, and traditional methods (mainly periodic abstinence and withdrawal). Excluded were implants and lactational amenorrhoea. For the purposes of this article, 'skewed method mix' is operationally defined as 50% or more of users in a given country reporting to use a single contraceptive method (or method category).

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The data for this analysis come from nationally representative surveys (primarily the Demographic and Health Surveys [DHS]) in 96 countries that had (1) a population of at least one million inhabitants and (2) a DHS-type survey conducted since 1980 (e.g. DHS or similar large scale surveys such as those conducted by the Centers for Disease Control and Prevention and other national research institutions). If the country had more than one survey, the most recent one was used.

Results

Skewed method mix

Of 96 countries with available data, 34 have at least half of all users reporting use of a single contraceptive method. Table 2 lists these countries and the method most widely used in each. Three primary patterns emerge.

First, almost half (16 of 34) of the high-skew countries are nations in which traditional methods predominate. Most of these countries are located in sub-Saharan Africa where contraceptive prevalence tends to be low. This finding suggests not only lack of choice of a range of methods, but also lack of access to modern contraception (possibly combined with low motivation to control fertility or knowledge of how to do so). Traditional methods also predominate in the three countries in the Caucasus region (Armenia, Azerbaijan and Georgia) and in Albania, Romania and Yemen.

The second group of countries consists of four nations in which female sterilization is the leading method. This group includes three Latin countries (Brazil, Dominican Republic and Panama) and one Asian country (India). As outlined below, factors relating to method skew for sterilization differ greatly between Latin America and Asia.

A third group of countries is characterized by reliance on a single reversible method: the pill (Algeria, Kuwait, Liberia, Morocco, Sudan and Zimbabwe), the IUD (Cuba, Egypt, Kazakhstan, Kyrgyz Republic, Moldova, Turkmenistan and Uzbekistan) and the injectable in Malawi. The two male methods – vasectomy and condom – did not predominate in any of the 34 high-skew countries.

Table 3 shows the full list of countries included in this analysis along with the year of data collection, the distribution of users across the seven method categories, the contraceptive prevalence rate and the total fertility rate. The grouping of countries by region allows for greater appreciation of contraceptive dynamics within each region. The method(s) with the highest percentage of users in each country is highlighted in bold.

Possible explanations of method predominance from the literature

What accounts for the predominance of a particular method in a given country? The published family planning literature provides considerable insight into the patterns of method skew and reasons for the predominance of specific methods in some of the 34 countries with the greatest method skew.

This review of the literature points both to supply and demand as key determinants of method choice. On the one hand, government policies have strongly

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Table 2. Countries in which half or more currently married women rely on a single contraceptive method (of 96 countries examined)

Country	Traditional methods	Female sterilization	Pill	IUD	Injectable
Albania	✓				
Armenia	✓				
Azerbaijan	✓				
Benin	✓				
Cameroon	✓				
Central African Republic	✓				
Chad	✓				
Democratic Republic of Congo	✓				
Cote d'Ivoire	✓				
Gabon	✓				
Georgia	✓				
Madagascar	✓				
Romania	✓				
Rwanda	✓				
Togo	✓				
Yemen	✓				
Brazil		✓			
Dominican Republic		✓			
India		✓			
Panama		✓			
Algeria			✓		
Kuwait			✓		
Liberia			✓		
Morocco			✓		
Sudan			✓		
Zimbabwe			✓		
Cuba				✓	
Egypt				✓	
Kazakhstan				✓	
Kyrgyz Republic				✓	
Moldova				✓	
Turkmenistan				✓	
Uzbekistan				✓	
Malawi					✓

influenced method availability in some countries, especially those with explicit goals of fertility reduction. On the other, individual preferences and social norms play an important role, especially where clients have choice. Yet these 'preferences' defy easy categorization. In a review of issues related to method choice, Shah (1995) notes that in every country with moderate or high prevalence, the great bulk of use is accounted for by just two or three methods. However, the principal method preferred *differs*

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Table 3. Method mix and contraceptive prevalence rate for currently married women and total fertility rate by region and country

Country	Date	F. ster.	Vasec.	Pill	Inject.	IUD	Barrier	Trad.	CPR	TFR
Sub-Saharan Africa (n=35)										
Benin	2001	1·7	0·0	10·1	11·7	4·5	8·4	**63·7**	18·6	5·6
Botswana	2000	3·2	0·2	**36·5**	24·8	3·2	28·0	4·0	40·4	4·1
Burkina Faso	2003	0·8	0·0	17·9	20·3	3·3	17·1	**40·7**	13·8	6·2
Burundi	2000	1·3	0·6	25·0	30·1	5·1	1·3	**36·5**	15·7	6·8
Cameroon	1998	7·7	0·0	10·3	3·6	3·1	11·9	**63·4**	19·3	4·8
Central African Republic	2000	1·1	0·0	17·3	2·2	0·7	3·2	**75·5**	27·9	5·1
Chad	1996/97	4·8	0·0	14·3	4·8	0·0	4·8	**71·4**	4·1	6·4
Democratic Republic of Congo	2001	1·3	0·3	3·2	1·0	0·3	7·6	**86·3**	31·4	6·7
Cote d'Ivoire	1998/99	0·7	0·0	23·3	9·3	2·7	12·0	**52·0**	15·0	5·2
Eritrea	2002	3·3	0·0	23·3	**43·3**	6·7	10·0	13·3	8·0	4·8
Ethiopia	2000	3·8	0·0	31·3	**38·8**	1·3	3·8	21·3	8·1	5·5
Gabon	2000	3·2	0·0	15·4	1·6	0·6	16·7	**62·4**	32·7	4·2
Ghana	2003	7·9	0·0	23·0	22·6	3·8	15·5	**27·2**	25·2	4·4
Guinea	1999	4·8	0·0	**33·9**	16·1	3·2	9·7	32·3	6·2	5·5
Kenya	2003	11·5	0·0	20·0	**38·1**	6·4	3·2	20·8	39·3	4·9
Lesotho	1992	4·5	0·0	**31·8**	0·0	13·6	**31·8**	18·2	23·0	4·8
Liberia	1986	17·2	0·0	**51·6**	4·7	9·4	3·1	14·1	6·4	6·7
Madagascar	1997	5·2	0·0	12·6	24·6	2·6	4·2	**50·8**	19·4	6·0
Malawi	2000	15·6	0·3	9·0	**54·5**	0·3	5·3	15·0	30·6	6·3
Mali	2001	4·4	0·0	**41·2**	30·9	2·9	4·4	16·2	8·1	6·8
Mauritania	2000/01	1·3	0·0	**33·8**	11·7	10·4	10·4	32·5	8·0	4·5
Mauritius	1991	9·6	0·3	28·0	5·5	3·7	18·3	**34·5**	74·7	2·3†
Mozambique	2003	5·5	0·0	**29·7**	29·1	0·6	6·7	28·5	16·5	5·5
Namibia	2000	19·4	1·8	18·7	**42·7**	2·7	12·1	2·5	43·7	4·2
Niger	1998	1·2	0·0	34·1	18·3	1·2	1·2	**43·9**	8·2	7·2
Nigeria	2003	1·8	0·0	16·5	18·3	6·4	17·4	**39·4**	12·6	5·7
Rwanda	2000	6·8	0·0	8·5	16·2	0·9	3·4	**64·1**	13·2	5·8
Senegal	1997	3·9	0·0	26·0	13·4	12·6	6·3	**37·8**	12·9	5·7
South Africa	1998	28·1	3·7	18·8	**41·2**	3·2	3·0	2·0	56·3	2·9
Swaziland	2000	21·7	0·0	19·5	**41·9**	4·3	6·5	6·1	27·7	4·6
Tanzania	1999	8·6	0·0	22·7	27·0	1·7	11·6	**28·3**	25·4	5·6
Togo	1998	1·7	0·0	5·2	9·1	4·3	7·8	**71·7**	23·5	5·2
Uganda	2000/01	10·9	0·0	17·5	**35·0**	1·1	10·4	25·1	22·8	6·9
Zambia	2001/02	6·4	0·0	**38·0**	14·4	0·3	12·5	28·4	34·2	5·9
Zimbabwe	1999	5·0	0·2	**68·0**	15·5	1·7	3·4	6·1	53·5	4·0
Middle East & North Africa (n=15)										
Algeria	1995	0·0	0·0	**84·5**	0·0	7·7	2·1	5·8	52·0	3·3†
Egypt	2000	2·6	0·0	17·4	11·2	**65·1**	1·8	1·8	56·1	3·5
Iran	1994	16·4	1·8	**32·6**	0·0	11·5	9·7	27·9	70·0	4·5†
Iraq	1989	7·4	0·0	**37·0**	0·0	22·2	11·1	22·2	14·0	6·1†

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Table 3. *Continued*

Country	Date	F. ster.	Vasec.	Pill	Inject.	IUD	Barrier	Trad.	CPR	TFR
Jordan	2002	5·5	0·0	14·2	1·7	**44·6**	6·4	27·6	55·8	3·7
Kuwait	1996	4·2	0·0	**57·4**	0·0	13·5	6·4	18·5	50·2	2·7†
Libya	1995	12·5	0·0	25·0	0·0	27·5	0·0	**35·0**	40·0	3·8†
Morocco	1995	8·5	0·0	**64·0**	0·2	8·5	3·0	15·7	50·3	3·3†
Oman	1995	22·7	0·0	**27·3**	0·0	9·1	27·3	13·6	22·0	5·9†
Sudan	1993	10·9	0·0	**54·3**	0·0	10·9	2·2	21·7	10·0	5·3†
Syria	1993	5·6	0·0	25·0	0·0	**39·6**	1·3	28·5	39·6	5·3†
Tunisia	1988	23·1	0·0	17·7	1·6	**34·1**	4·6	18·9	49·8	4·2
Turkey	1998	6·6	0·0	6·9	0·8	31·0	13·8	**40·9**	63·9	2·6
United Arab Emirates	1995	14·8	0·4	**44·3**	0·0	14·8	14·8	11·1	27·0	3·2†
Yemen	1997	6·7	0·5	18·2	5·7	14·4	1·9	**52·6**	20·8	6·5
Latin America & Caribbean (n=18)										
Bolivia	2003	11·6	0·0	6·5	14·3	18·3	7·3	**41·9**	58·4	3·8
Brazil	1996	**52·3**	3·4	27·0	1·6	1·4	5·9	8·5	76·7	2·5
Colombia	2000	**35·6**	1·3	15·5	5·3	16·3	9·1	17·0	76·9	2·6
Costa Rica	1993	**26·3**	1·7	24·0	1·3	11·6	21·2	13·9	75·0	2·1
Cuba	2000	25·9	0·0	4·9	1·4	**59·2**	6·9	1·8	73·3	1·6
Dominican Republic	2002	**66·6**	0·1	19·6	2·8	3·2	1·9	5·8	69·8	3·0
Ecuador	1999	**35·6**	0·0	17·3	5·2	16·0	4·3	21·6	66·3	3·3
El Salvador	2002/03	**49·2**	0·0	8·7	27·5	2·0	4·4	8·3	67·3	2·9
Guatemala	2002	**38·8**	2·3	7·9	20·8	4·4	5·5	20·3	43·3	4·4
Haiti	2000	11·0	1·6	9·0	**46·3**	0·4	11·4	20·4	28·1	4·7
Honduras	2001	**29·0**	0·2	16·8	15·6	15·5	5·3	17·6	61·8	4·4*
Jamaica	1997	18·6	0·3	**32·1**	16·6	1·6	25·9	4·8	64·4	2·8
Mexico	2003	**45·8**	2·1	8·2	5·9	18·3	8·5	11·1	74·5	2·5
Nicaragua	2001	**37·8**	0·7	21·8	21·4	9·6	4·9	3·7	68·6	3·2
Panama	1984	**55·7**	0·7	20·3	1·4	10·3	4·8	6·9	58·2	3·2
Paraguay	2004	15·8	0·1	**20·6**	14·3	15·8	16·6	16·9	72·8	2·9
Peru	2000	18·1	0·7	9·8	21·7	13·4	9·1	**27·2**	68·9	2·8
Trinidad & Tobago	1987	15·6	0·4	26·6	1·5	8·3	**31·9**	15·7	52·7	3·1
Asia & Pacific (n=16)										
Bangladesh	1999/2000	12·6	0·9	**43·3**	13·6	2·4	8·0	19·1	54·3	3·3
Cambodia	2000	7·2	1·0	21·6	**35·6**	6·3	4·3	24·0	23·8	3·8
China	1992	**42·0**	12·0	3·6	0·2	39·6	2·4	0·2	83·4	2·0
Hong Kong	1992	21·8	1·1	19·5	0·0	5·7	**43·7**	8·0	86·0	1·3
India	1998/99	**70·7**	3·9	4·4	0·0	3·3	6·4	11·2	48·2	2·8
Indonesia	2002/03	6·6	0·7	23·7	**49·8**	11·1	1·6	6·5	60·3	2·4
Republic of Korea	1994	**37·0**	15·0	2·3	0·0	13·6	18·5	13·7	77·4	1·7
Malaysia	1993	16·0	0·0	28·9	1·2	7·1	11·9	**34·9**	49·5	3·3
Myanmar	1997	16·9	6·8	22·8	**36·0**	4·0	0·3	13·2	32·7	3·3†
Nepal	2001	**39·0**	16·4	4·2	21·8	1·0	7·5	10·1	39·3	4·1
Pakistan	1990/91	**29·7**	0·0	5·9	6·8	11·0	22·9	23·7	11·8	4·9
Philippines	2003	21·6	0·2	27·2	6·4	8·5	3·9	**32·2**	48·9	3·2†
Sri Lanka	1993	**35·6**	5·6	8·3	7·0	4·5	5·0	33·9	66·1	2·5

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Table 3. *Continued*

Country	Date	F. ster.	Vasec.	Pill	Inject.	IUD	Barrier	Trad.	CPR	TFR
Taiwan	1992	**33·0**	2·0	6·0	0·0	27·0	22·0	10·1	82·0	1·8
Thailand	1996	30·5	2·8	**32·0**	22·7	4·4	4·3	3·3	72·2	2·1†
Vietnam	2002	7·5	0·6	8·0	0·5	**48·1**	7·4	27·8	78·5	2·3
Eastern Europe & Central Asia (n=12)										
Albania*	2002	5·2	0·0	1·3	0·5	0·7	2·8	**89·5**	75·1	2·6*
Armenia	2000	4·6	0·0	1·9	0·2	16·0	12·1	**65·2**	60·5	1·7*
Azerbaijan	2001	2·2	0·0	1·8	0·0	11·0	6·3	**78·7**	55·4	2·1*
Czech Republic	1993	4·0	0·0	11·9	0·0	22·8	25·2	**36·0**	68·9	1·9*
Georgia	1999/2000	4·1	0·0	2·5	0·0	24·7	16·0	**52·7**	40·5	1·7*
Kazakhstan	1999	4·3	0·0	3·7	0·9	**65·1**	7·6	18·3	66·1	2·1*
Kyrgyz Republic	1997	3·0	0·0	2·9	2·2	**64·2**	9·7	18·0	59·5	3·4*
Moldova	1997	4·6	0·0	2·9	0·0	**52·3**	8·0	32·2	73·7	1·8*
Romania	1999	3·9	0·0	12·5	0·0	11·5	17·9	**54·2**	63·8	1·3*
Turkmenistan	2000	3·4	0·0	2·2	1·9	**72·6**	3·7	16·2	61·8	2·9*
Ukraine*	1999	2·1	0·0	4·5	0·0	27·7	21·3	**44·5**	67·5	1·4*
Uzbekistan	2002	4·0	0·0	2·5	3·1	**79·8**	3·1	7·6	67·7	3·3*

*Data for women aged 15–44.
†TFR data provided for year different from data for contraceptive method mix and CPR.

from one country to another, as do the *reasons* why clients prefer each method. Weak though it seems as an explanation, the historical factor that certain methods 'take root' definitely plays a role in a number of countries (Potter, 1999).

Traditional methods. In almost half (16 of 34) of the high-skew countries, traditional methods predominate. Contraceptive prevalence rates in sub-Saharan Africa countries tend to be quite low, ranging from 4% in Chad to 33% in Gabon. Multiple factors explain the widespread use of traditional methods (primarily post-partum abstinence, rhythm and withdrawal). First, there is a long-standing tradition of post-partum abstinence in a number of African countries, intended to ensure an adequate interval between births. Motivation was not to limit the number of children but rather to increase the chances that each child would survive (Page & Lesthaeghe, 1981). Nonetheless, this practice does set an important precedent for birth spacing that increases the acceptability of family planning programmes in Africa. Long-term abstinence (extending to a period of 2–3 years in some traditional societies) has its correlate in periodic abstinence (or rhythm), which many couples report using despite the low levels of knowledge of the fertile period in the woman's cycle. Other factors reinforcing the use of traditional methods include the lack of availability of contraceptive methods in many parts of Africa, weak social support for family planning use (which becomes 'public' with a clinic visit) and the barrier of costs, to mention a few. These coupled with a relatively low motivation for limiting births have created a certain default towards traditional methods, which can be used

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with little effort, at little cost, but with limited effectiveness (National Academy of Sciences, 1993).

Traditional methods (primarily withdrawal) also predominate in the Caucasus region (Armenia, Azerbaijan, Georgia), as well as in Albania and Romania. The strong reliance on traditional methods stems from a history of limited access to effective modern contraception, the poor quality of condoms made in local factories, and the accessibility and acceptability of abortion. In all five of these countries, 87% or higher of women of reproductive age know of contraception; and curiously, the percentage of women who are aware of contraception is as high if not higher for modern than traditional methods (CDC & ORC Macro, 2003). A reason for high knowledge and low use of modern contraceptives may be that abortion remains a primary method of controlling fertility, and serves as a back-up method in case of an unintended pregnancy. The use of abortion means that while awareness of contraceptives and traditional methods is high, and access is available, women do not need to make a family planning choice in order to ensure desired family size.

In all of these countries, high proportions of women report being subfecund or infecund (from 15% in Azerbaijan to 44% in Romania). Many women who *do not* intend to use contraception report reduced fertility as the reason for not using contraception. Traditional method users may feel at decreased risk of pregnancy for similar reasons, and thus feel that modern contraception is an unnecessary expense – in terms of time, money and harmful health effects – especially when abortion offers a safety net in case of unintended pregnancy.

Yemen is a Middle Eastern country characterized by high fertility and slowly declining infant and child mortality rates. Although a population policy was proposed in 1991, contraceptive use remains low at 21% and the country has not seen a substantial decrease in population growth (Inaoka *et al.*, 1999). The lack of progress in family planning has been attributed to an inadequate health system and barriers related to the culture of Islam (Inaoka *et al.*, 1999). Curiously, while the 1997 Yemen Demographic and Health Survey found that women had moderate knowledge of the pill (76%), IUD (64%) and injectables (56%), use of these methods lags behind and remains below 4% of the method mix (Population Council, 1999). This low use of modern methods seems to be related to a relatively large number of users who report that they have experienced problems with their contraceptive method (35%) and/or that have health concerns (93%). These health concerns in turn translate into high discontinuation rates leaving traditional methods that have little or no side-effects as the preferred method.

Female sterilization. Ross (1992) points out that the high level of sterilization on a global basis results from four factors: its adoption by a wide age range of women, its longstanding availability in many countries, the high levels of continuation (barring some type of failure in the operation) and the levels of adoption. Of key importance from a programmatic perspective is whether the high level of prevalence reflects societal and individual preferences or instead reflects a lack of access to other methods.

Given the permanent nature of this method, the predominance of sterilization in a given country raises specific concern. In India, government policy has played a large

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role in its method skew. In the three others – all Latin American countries (Brazil, the Dominican Republic and Panama) – sterilization seems to have become a pervasive societal norm.

In India, concern for population growth dates back half a century. In 1952 India became the first country in the world to establish an official national family planning (FP) programme. In subsequent years a variety of approaches, including diverse incentives, were tried to expand the delivery of FP services to India's vast population, 80% of whom resided in rural areas (David, 1982). However, in contrast to most developing countries that embrace the 'cafeteria approach' to service delivery, India devoted its primary FP efforts toward sterilization. In a 1984 article Basu alluded to this singular focus: 'the method most vigorously propagated and as vigorously opposed is sterilization. Indeed, the increased emphasis on sterilization as the primary method of FP means that even the nominal promotion of other methods tended to fall by the wayside.' As a result, 'in the smaller villages, fertility control and sterilization are believed to be synonymous.' Indian Population Project district programme managers have further institutionalized the promotion of sterilization by judging medical officers on their ability to promote sterilization during performance reviews conducted in rural areas of Karnataka State in 1990 (Rajaretnam & Deshpande, 1994). In 1996, India abandoned 'targets' for sterilization, but the legacy of this method has persisted (Donaldson, 2002).

Data from recent nationwide fertility studies are consistent with this observation. The 1992–1993 National Family Health Survey (NFHS) found that among almost 90,000 women, 95% knew of female sterilization, compared with only 58–66% who knew the pill, IUD and condom (International Institute for Population Sciences, 1994). A more recent survey found that among the 48% of married women using contraception, almost three-quarters rely on sterilization (International Institute for Population Sciences & ORC Macro, 2000). In addition, although the 1998–99 NFHS shows an increase in contraceptive use from 42% in 1991 to 48% in 1999, this increase is overwhelmingly due to sterilization. Despite low use of reversible methods, another recent study conducted in India indicates that when women are given balanced information about a choice of contraceptive options, they will opt for reversible methods (Baveja, 2000).

The apparent reasons for the high level of sterilization in Latin America differ considerably from those in India. Sterilization has been a widely accepted means of limiting fertility, especially for women who marry young and have closely spaced pregnancies, yet adhere to the small family norm. The high levels of sterilization in the Dominican Republic can be traced to the country's long tradition of offering this method, dating back to the 1940s (although it was only offered as a programme method in 1977). According to Baez (1992), early access to female sterilization contributed to forming a new reproductive pattern still observed among women in union, one in which fertility levels have decreased in an important way but in which early nuptiality and short birth intervals persist. In the Dominican Republic close to two-thirds of users rely on female sterilization (Remez, 1993). Recent studies show that women tend to prefer the pill before age 30, and that over half of the sterilized women had their operation before age 30. Knowledge of other contraceptive methods is almost universal; however, there appear to be widespread misconceptions about

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reversible methods and a lack of information about the correct use of the pill, accompanied by high failure rates that may have further contributed to the use of sterilization (Loaiza, 1995).

In Panama, sterilization makes up 56% of method use. This trend can be traced back to the period between 1976 and 1984 when contraceptive use rose by 10% and the method mix shifted away from pill use and toward IUD use and adoption of female sterilization (Warren *et al.*, 1987). The case of method skew in Panama appears to be largely demand driven. Whereas the Government of Panama provided family planning as a service of public medical and health facilities starting in the 1970s to meet the demand for contraceptives, it did not develop any specific family planning goals (Bogue *et al.*, 1986). As early as 1986, over three-quarters of women not currently sterilized indicated that they wanted to be sterilized now or after they had achieved their desired family size. Among those who reported that they would like the operation now, the main barrier to receiving the operation was institutional: women were too young or had too few children (Guerra *et al.*, 1986).

The move away from a temporary method (the pill) and toward a permanent method such as female sterilization may be cause for concern given that 40% of women who were sterilized had never used any other method of family planning and that the average age of sterilization is 30 years and the majority of women marry on average at 20 years of age (Warren *et al.*, 1988). It is unclear how this ten-year gap is covered by temporary methods for purposes of birth spacing.

In Brazil, 52% of users rely on female sterilization. The dynamics behind this choice are more complex in Brazil than in the other Latin American countries in which sterilization predominates. Brazil did not have a national FP programme until 1983, although the relatively high standard of living in urban areas generated a strong demand for fertility control. Thus, most users in Brazil have had to rely on the private sector for methods (Giffin, 1994). Pills have been available in local pharmacies since the 1960s, but in the absence of a national programme, information and counselling on the correct use of the pill was lacking. Data from five *favelas* (slums) in Rio de Janeiro in 1984 showed that 85% of those using the pill obtained their method from the drugstore, 96% without a prescription (Costa *et al.*, 1989). A study in southern Brazil found that over 50% of women who had ever used oral contraceptives reported they had a problem that they attributed to pill use, and almost three-quarters of those who reported problems stopped using the pill (Janowitz *et al.*, 1986). This lack of information about side-effects and improper use contributed to contraceptive failures and an increase in the demand for irreversible methods, primarily female sterilization (Population Reference Bureau, 1998).

Curiously, female sterilization has emerged as the method of choice in Brazil *despite* medical barriers to its use. The Brazilian Medical Ethics Code at one point condemned female sterilization. Prior to 1997 female sterilization was not routinely available as a contraceptive method, although women could obtain the procedure in connection with a Caesarean section for an additional fee. Some have speculated that the high rate of C-sections in Brazil was strongly motivated by the desire for female sterilization, which could only be obtained in this manner. In 1997 legislation was finally passed that established criteria for sterilization, and several hospitals were then accredited to perform the operation.

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The pill. The pill predominates in six of the high-skew countries: Algeria, Kuwait, Liberia, Morocco, Sudan and Zimbabwe. Three of the six countries with skew toward pill use are North African countries: Algeria, Morocco and Sudan.

In Algeria, during the late 1970s and early 1980s promoters of contraception introduced a contraceptive method that had a low up-front cost and did not require medical personnel. The pill fitted that market niche. Early contraceptive promoters then used a marketing scheme that linked the pill – *Kina* – to the popular *Aspo* (aspirin), which was marketed as a 'miracle drug' that could cure a variety of ailments (M. Bouzidi, personal communication). Thus, the pill was tied to a brand that was already popular with the public. Method skew in Algeria may also be related to early criticism levelled at the government's 1986 mass media campaign; although the campaign promoted limiting family size, it did not provide information about particular contraceptive methods or information about contraceptive indications or contraindications (Coliver, 1995). Because this mass media campaign had a broad family health focus, it failed to educate the public on the range of contraceptive methods from which they could choose.

Studies from Morocco (Brown *et al.*, 1995; Hajji & Lakssir, 1996) identify several converging factors that explain the predominance of the pill. There appears to be some provider bias toward pill use, which is strongly reinforced by the widespread social acceptance of the pill and its convenience for providers (Hajji & Lakssir, 1996). Women come to the clinics wanting and expecting to get the pill, and providers try to accede to their wishes. Despite a concerted government investment in the early 1990s in training, equipment and supplies for IUD insertion, this method only increased from 8 to 9% of the method mix between 1991 and 1995 (Ministry of Health & EVALUATION Project, 1998).

Sudan is a third North African country where the pill dominates the method mix. Although modern FP methods have been available since the mid-1960s, the provision of services through the Sudan Family Planning Association has been limited to urban areas, thus reaching less than a quarter of the population (Swar-Eldahab, 1993). Contraceptive prevalence (all methods) was only 10% according to 1993 data (Ross *et al.*, 1999). Policy-makers have actively encouraged population growth (Eltigani, 2001) and women tend to space rather than limit their births (Taha, 1993). Findings from the 1989–1990 Sudanese Demographic and Health Survey (SDHS) show that among women who want more children, at least half would like to wait at least two years (Klitsch, 1991). In addition, among married women sampled in the 1989–1990 SDHS who knew at least one contraceptive method, 70% knew of the pill, whereas less than half knew of female sterilization or injectables (Klitsch, 1991). According to the 1989–1990 SDHS, the pill appears to be the only non-clinical method that is widely available. The other methods available – IUD and female sterilization – are not appropriate for the majority of women who wish to space rather than limit their births (Ministry of Economics and National Planning & Macro International, 1991).

Liberia is another African country in which pill use makes up over half of the method mix. Largely unstable throughout the late 80s and early 90s due to a seven-year civil war, the country has struggled to resurrect primary health care services since a peace agreement was reached in 1996. Although the Family Planning Association of Liberia (FPAL) was formed in 1956 to provide information, education

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and communication, contraceptive distribution, and other services, the contraceptive prevalence rate as of 1986 was just 6%.

The 1986 Liberia Demographic and Health Survey sheds some light on the propensity for pill use. Results indicate that 70% of married women knew at least one contraceptive method. Of these, women were more likely to report that they knew a modern method (68%) than a traditional method (28%), and the most widely known method was the pill at 61% (Chieh-Johnson *et al.*, 1988). In terms of sources of contraceptive methods, the FPAL provided 40% of FP services, while government hospitals and clinics provided 29% of services and 23% relied on private sector services (Chieh-Johnson *et al.*, 1988). Among all current contraceptive users, pill users were more likely to name the FPAL as their service provider than users of other methods, and government hospitals or clinics were cited as the primary source for other modern methods (Chieh-Johnson *et al.*, 1988). The dominance of the pill appears to reflect a combination of supply and demand factors: women are more knowledgeable about the pill and it is available to them through the FPAL.

In the case of Kuwait, several factors contribute to the predominance of the pill. Kuwaiti nationals comprise less than half (43%) of the population, and the government has instituted policies to increase the number of Kuwaitis: a marriage bonus, monthly allowances for each child, free education and medical care, generous maternity leave, and other incentives. Although contraceptive prevalence is in the moderate range (35% as of 1987), it is primarily for birth spacing, not family size limitation (Al-Gallaf *et al.*, 1995). Thus, it is not surprising that the method of choice is one that allows for easy resumption of childbearing when desired (Shah & Kamel, 1985). The pill has been the method of choice since data on contraceptive use became available in the 1970s. Several factors explain its primacy. The pill is readily available free of charge from government hospitals or at low cost in pharmacies; it is acceptable under Muslim religion; and women consider it to be convenient to use. And although users perceive side-effects, there are no major rumours about the health effects of the pill. This preference for the pill is expected to continue unabated in the near future, as most women 'intending' to use contraception in the future also cite it as their preferred method (Al-Gallaf *et al.*, 1995).

The predominance of the pill in Zimbabwe represents a mix of supply and demand factors. From the supply side, the primary family planning service delivery mechanism has been community-based distribution (generally considered to be among the most successful of its type in Sub-Saharan Africa), which requires the provision of non-clinical methods. In terms of demand, the Zimbabwe population has shown great interest in family planning for the purposes of spacing rather than limitation, explaining why a reversible method would have strong appeal in this country (Way *et al.*, 1987). In the early 1980s, the most common method in Zimbabwe was Depo-Provera, but it was replaced by a progestin-only pill. The abandonment of Depo narrowed the method mix and contributed to the current 'single method' phenomenon in Zimbabwe.

The IUD. In Cuba, there are two primary means of controlling fertility: abortion and the IUD. The former is legal, though recent statistics suggest a decreasing reliance

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on this method from 70 abortions per 100 deliveries in 1992 to 59·4 in 1996 (PAHO, 1998). Although abortion is not considered a means of pregnancy prevention, it is a highly effective means of fertility control; with one of the highest abortion rates in the world Cuba is reported to have a TFR of 1·6. The widespread use of the IUD appears to relate to the high effectiveness and the low cost of this method: both important considerations in a health system that is particularly strapped for cash and has no access to commodities from the usual donors (e.g. USAID or UNFPA). According to PAHO (1998), the national family planning programme is seeking to expand the variety of contraceptives available, increase their use and enhance their quality, which could help reduce the reliance on abortion and the IUD.

In Egypt an explicit government policy favours lower fertility, but the programme has promoted family planning on a voluntary basis for the health and economic benefits that it brings to families. It differs from India in that voluntarism has been a strong part of the programme. Method choice is restricted primarily to reversible methods, given religious objections to the use of sterilization in most Muslim countries (although there are occasional exceptions, such as Iran). However, the strong preference for the IUD over the pill (the other method that has been available over the long-term in Egypt) can be traced to (1) the lack of adequate information about how to use other methods, in particular the pill (Edwards, 1994; Trottier *et al.*, 1994; Stewart, 1995) and (2) the widespread availability of the IUD from multiple sources, including private doctors and government facilities (Edwards, 1994; Stewart, 1995). The large number of trained physicians in Egypt (comfortable with performing clinical procedures) may also contribute to the disproportionately high use of IUDs. In the absence of sterilization, the IUD took over the 'limiting' niche.

Use of the IUD predominates in the four countries of Central Asia: Kazakhstan, Turkmenistan, Uzbekistan and the Kyrgyz Republic, as well as in Moldova. The contraceptive patterns of this region reflect the strong influence of the former Soviet regime. Throughout most of the 20th century, the principal method of birth control in the Soviet Union was abortion (Popov, 1993). Contraception during the communist regime was legal for the most part; however, effective modern contraception was not available to most of the population. The Soviet medical establishment considered oral contraceptives to be unsafe, and other modern methods were expensive to import. Condoms and IUDs manufactured domestically were crude and unpopular (Storey *et al.*, 1994; Westoff, 2000). Provider resistance, fear about possible side-effects (particularly associated with hormonal methods), cultural norms and partners' opposition made it difficult for many women to obtain modern contraception (CDC & ORC Macro, 2003).

The collapse of the Soviet Union in 1991 brought profound social, economic and cultural changes, including an effort by governments to promote modern contraceptive use, not as a means to control fertility but rather to improve the health of women by reducing the widespread use of abortion. Most readily available was the IUD, reflecting a carry-over in negative attitudes toward oral contraception from Soviet times (Popov & David, 1999). While several countries have aggressively tried to introduce alternative modern methods, such as the social marketing programme in Uzbekistan that introduced five brands of pills and two of injectables (Asadov *et al.*, 1997), the use of IUD prevails.

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The injectable. The injectable predominates in a single African country: Malawi. Over the past decade, Malawi has seen an extraordinary increase in the use of modern contraceptives. In the 1992 Malawi Demographic and Health Survey (MDHS) 7% of married women reported using a modern method; this number jumped to 31% in the 2000 MDHS (National Statistical Office [Malawi] & ORC Macro, 2001). Much of this dramatic increase is due to uptake of the injectable, which rose from 6% in 1996 to 16% in 2000, overtaking the pill as the favoured form of contraception (National Statistics Office [Malawi] & ORC Macro, 2001). This propensity for the injectable appears to be driven largely by demand factors. Among married women who stated that they intended to adopt a contraceptive method in the future, 59% reported that they intended to use the injectable, followed by the pill (18%) and female sterilization (10%). This finding signals a major shift in preference from the 1992 MDHS, where 51% of women reported they intended to use the pill and only 16% preferred the injectable (National Statistics Office [Malawi] & ORC Macro, 2001).

In the case of Malawi, the preference for the injectable appears to be largely demand driven: 78% of women reported that they had been informed of other contraceptive choices, suggesting that the preference for the injectable is not related to a systematic limitation of other methods or a provider bias for this particular method. Anecdotal evidence suggests that women prefer the injectable because it is a 'discrete method' that a woman can use without informing or obtaining permission from her partner.

Discussion

This brief review in high-skew countries indicates that multiple factors explain method skew. In certain cases past government policy, including use of targets and incentives, strongly influences method skew, especially for sterilization (in the case of India) but also for a reversible method (such as the IUD in Egypt). Curiously, China does not make the list of countries with a skewed method mix, despite its notorious record for heavy-handed techniques to ensure fertility control. China has two methods that are widely used: female sterilization (by 42% of users) and the IUD (by 40% of users). Although neither method 'predominates', China is another example of a country in which government policies strongly influence method choice.

A second important factor is availability, both current and past. In some African countries method skew may result from limited access to modern methods in general. In other countries there appears to be a self-perpetuating cycle of acceptance of a method that has been available and widely used for a long time, such as the case of the pill in Morocco or female sterilization in the Dominican Republic. Yet, this supply factor (availability) at some point converts to a societal preference, through word of mouth communication and client satisfaction. Potential users arrive at the clinic wanting the method that their friend, sister or co-worker uses (Potter, 1999). The International Conference on Population and Development in Cairo in 1994 called for client-centred services, and as a result service providers are more likely to give clients the method that they want, which may further perpetuate the use of the predominant method.

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Why does contraceptive method skew matter? Contraceptive choice is a key element of quality in family planning services because it represents a reproductive right (Bruce, 1990). Furthermore, an appropriate method mix not only assists individuals in achieving their reproductive goals; it also benefits nations, allowing them to achieve their health and development objectives. Method skew is particularly problematic if driven by supply factors such as a restrictive population policy, lack of availability of a range of methods, lack of information on method choices, or provider bias toward one or two methods. Supply side restrictions imply that women are being denied their right to information and access, which in turn denies them their right to choose the method they prefer to use to meet their reproductive needs.

A study conducted by Jain (1989) illustrates why method skew matters. Using data from 72 countries included in the 1982 Family Planning Programme Effort study, he demonstrates that by increasing one element, the availability of contraceptive methods, contraceptive use would increase significantly. In a more recent study, Ross *et al.* (2001) also show that a restricted method mix reduces the opportunity for couples to meet their reproductive needs and reduces overall contraceptive use. Using data from four cycles of the Family Planning Programme Effort studies, Ross *et al.* (2001) found that contraceptive prevalence is highest in countries where access to contraceptive methods is consistently high across methods. What these studies show is that increased availability of a range of contraceptive methods would allow individuals and couples to better achieve their reproductive goals, whether they wish to delay, space or limit births. They also demonstrate that overall contraceptive use would increase as availability to a range of methods increased.

This article demonstrates the utility of using a cut point to flag method skew for the purposes of drawing attention to its programmatic and reproductive rights implications. Method skew is operationally defined as over 50% of users using a single contraceptive method. This approach to measuring method skew has several advantages. It is easy to understand; it is available directly from DHS-type data; it is simple to use; and it is comparable across countries.

The disadvantage of this approach is that it is not very rich in information: it takes into account only one of the seven methods in the method mix (the dominant one), with no consideration for the distribution of others. Moreover, this measure reveals nothing about the reasons for the skew. Nor does it reflect whether clients are satisfied with their methods. Although the measure is useful for identifying a possible problem with quality, it is not sufficiently sensitive; that is, it will not change quickly over time and thus is not useful at the programmatic level as a monitoring tool.

Contraceptive choice is only one of the six elements of quality of care in the Bruce/Jain framework (Bruce, 1990), but it is an important one. Programmes that provide good contraceptive choice generally have a diverse method mix, given the widely varying tastes and preferences of clients and the different attributes of the methods themselves (e.g. effectiveness, cost, convenience). Moreover, research has shown that providing clients with their preferred methods results in better contraceptive use and continuation (Pariani *et al.*, 1991).

Identifying method skew has multiple uses. First, it allows donor agencies and others working at the international level to compare countries on the dimension of

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contraceptive choice. Second, it allows a given country to track its progress over time in reducing method skew. And third, it can be used as an advocacy tool to create awareness and sensitivity among programme administrators and other decision-makers to the need for a broad range of contraceptive methods.

This article encourages greater attention to the issue of method skew, but several caveats bear mention:

- Many factors affect method choice (Table 1), some of which are outside the control of programmes.
- Method mix may change very slowly despite creditable programme efforts to diversify the mix. Morocco is a case in point, where the pill continues to predominate despite extensive training of providers in IUD insertion. The slowness of change is particularly true for sterilization, given the cumulative effect of operations performed in previous years on method mix in any given year.
- Even if a country has one or two methods that predominate, other methods may play an important role for clients. For example, other methods may serve as 'in between' methods when couples have recently initiated contraceptive use, when they are switching, or when they are experiencing problems with their usual method (J. Ross, personal communication).
- The data are available from existing DHS-type surveys but they are subject to the limitations of this data source, the most important of which is that these types of surveys are only carried out once every 4–5 years in a given country.
- Efforts to 'improve' method mix ought not to be undertaken at the expense of good methods that happen to be popular. If one can demonstrate that clients have good access to a range of methods provided under quality conditions, then preference for a specific method may not be problematic.
- Cost could become a key factor in determining contraceptive method mix in the future. For example, in Cuba, China and Vietnam, countries that have not received a large influx of money from the outside, contraceptive use is driven by the low cost, but highly effective methods that are available: the IUD and female sterilization in China and the IUD in Cuba and Vietnam.
- This analysis used only seven categories of methods. Programmatic support of certain subcategories or other categories (e.g. female condom, NORPLANT) may also be warranted in the future.
- Whereas the 50% cutoff is a useful means of identifying method skew, it is important also to examine the *actual distribution of all methods* before undertaking actions to improve method mix or to evaluate such initiatives.

This work forms part of a larger effort that evolved during the 1990s to measure quality of care for the purposes of programme evaluation. Identifying quantifiable, objective measures of quality has been particularly challenging, given the multi-faceted nature of quality of care, as well as the different levels at which quality must be present (at the managerial/infrastructure level and during the provider–client interaction). The subjective nature of 'what constitutes quality' and different cultural expectations further complicate the task. Several approaches have been developed that yield quantifiable indicators of quality, the best known of which is the Situation Analysis (SA) developed by the Population Council (Miller *et al.*, 1997). A second

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instrument designed to measure quality of care in family planning programmes is the QIQ (Quick Investigation of Quality), a set of three instruments designed to provide data on a list of 25 indicators, developed and tested under the MEASURE *Evaluation* Project in collaboration with the Monitoring and Evaluation Subcommittee of the MAQ (MEASURE *Evaluation* & the Monitoring and Evaluation Subcommittee of the MAQ, 2000). The measure used herein to identify method skew captures a single dimension of quality (method choice), and as such it is much less comprehensive than the SA and the QIQ. However, it has the important advantage that it can be calculated from existing data, which is not the case with SA or QIQ.

In conclusion, the authors recommend further experimentation with indicators and tools to measure quality of care in family planning and reproductive health programmes. The quest for macro-levels indicators of quality should not stop with this simple 'predominant method' indicator of skew. Programmes will be best served by using this measure along with other measures of quality in the ongoing pursuit of improving quality and access in programmes throughout the world.

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References

Al-Gallaf, K., Al-Wazzan, H., Al-Namash, H., Shah, N. M. & Behbehani, J. (1995) Ethnic differences in contraceptive use in Kuwait: A clinic-based study. *Social Science and Medicine* **41**(70), 1023–1031.

Asadov, D. A., Ayupova, F. M., Faizieva, F. T. & Li, M. A. (1997) Contraception. In Uzbekistan, Ministry of Health, Institute of Obstetrics and Gynecology & Macro International (eds) *Uzbekistan Demographic and Health Survey 1996: Preliminary Report.* Ministry of Health and Institute of Obstetrics and Gynegology, Tashkent City, Uzbekistan, pp. 47–68.

Baez, C. (1992) *República Dominicana: La Esterilización como la Opción Unica. Una Solución?* Instituto de Estudios de Población y Desarrollo/Demographic and Health Survey/CELADE (Centro Latinoamericano de Demografía), Santiago, Chile.

Basu, A. A. (1984) Ignorance of family planning methods in India. *Studies in Family Planning* **15**(3), 136–142.

Baveja, R. (2000) Evaluating contraceptive choice through the method-mix approach. *Contraception* **61**, 113–119.

Bogue, D. J., Brackett, M. H., Mamlouk, M. E. & Tsui, A. O. (1986) *A Projection of Family Planning Needs and Costs: 1985–2000 (Panama)*. Social Development Center, Chicago, Illinois.

https://doi.org/10.1017/S0021932005026647 Published online by Cambridge University Press

Bongaarts, J. & Johansson, E. (2002) Future trends in contraceptive prevalence and method mix in the developing world. *Studies in Family Planning* **33**(1), 24–36.

Brown, L., Tyane, M., Bertrand, J. T., Lauro, D., Abou-ouakil, M. & de Maria, L. (1995) Quality of family planning services in Morocco. *Studies in Family Planning* **26**(3), 154–168.

Bruce, J. (1990) Fundamental elements of the quality of care: a simple framework. *Studies in Family Planning* **21**(2), 61–91.

Bulatao, R. A. (1989) Toward a framework for understanding contraceptive method choice. In Bulatao, R. A., Palmore, J. A. & Ward, S. E. (eds) *Choosing a Contraceptive: Method Choice in Asia and the United States.* Westview Press, Boulder, Colorado, pp. 277–304.

Centers for Disease Control and Prevention (CDC) & ORC Macro (2003) *Reproductive, Maternal and Child Health in Eastern Europe and Eurasia: Comparative Report.* Atlanta, GA and Calverton, MD.

Chieh-Johnson, D., Cross, A. R., Way, A. A. & Sullivan, J. M. (1988) *Liberia Demographic and Health Survey 1986.* Westinghouse Institute for Research Development, Columbia, MD.

Choe, M. K. & Bulatao, R. A. (1992) Defining an appropriate contraceptive method mix to meet fertility preferences. Paper presented at the *1992 Annual Meeting of the Population Association of America*, April 30–May 2, Denver, CO.

Coliver, S. (1995) *The Right to Know: Human Rights and Access to Reproductive Health Information.* Article 19, London, UK.

Costa, S. H., Martins, I. R., Pinto, C. S. & Freitas, S. R. (1989) A prática de planejamento familiar em mulheres de baixa renda no município do Rio de Janerio. *Cadernos de Saúde Pública* **5**, 187.

David, H. P. (1982) Incentives, reproductive behavior, and integrated community development in Asia. *Studies in Family Planning* **13**(5), 159–173.

Donaldson, P. J. (2002) The elimination of contraceptive acceptor targets and the evolution of population policy in India. *Population Studies* **56**, 97–110.

Edwards, S. (1994) Method use is relatively high in Egypt, but so are levels of unwanted births. *International Family Planning Perspectives* **20**(4), 158–160.

Eltigani, E. E. (2001) Childbearing in five Arab countries. *Studies in Family Planning* **32**(1), 17–24.

Galway, K. & Stover, J. (1995) *Determining an Appropriate Contraceptive Method Mix.* The Futures Group International, Inc., Washington, DC.

Giffin, K. (1994) Women's health and the privatization of fertility control in Brazil. *Social Science and Medicine* **39**(3), 355–370.

Guerra, F., Warren, C. W., Oberle, M. W. & Morris, L. (1986) *Maternal Child Health/Family Planning Survey, Panama 1984*. Unpublished.

Hajji, N. & Lakssir, A. (1996) *Etude qualitative sur le dispositif intra utérin au Maroc*. Ministère de la Santé Publique, Direction de la Population Programme de Planification Familiale, Rabat, Morocco.

Inaoka, E., Wakai, S., Nakamura, Y., Al Babily, Y. & Saghayroun, A. A. R. (1999) Correlates of visit regularity among family planning clients in urban Yemen. *Advances in Contraception* **15**, 257–274.

International Institute for Population Sciences (1994) *National Family Health Survey, India 1992–199, Introductory Report*. International Institute for Population Sciences, Bombay, India.

International Institute for Population Sciences & ORC Macro (2000) *National Family Health Survey (NFHS-2), 1998–99, India*. International Institute for Population Sciences, Mumbai, India.

Jain, A. K. (1989) Fertility reduction and the quality of family planning services. *Studies in Family Planning* **20**(1), 1–16.

https://doi.org/10.1017/S0021932005026647 Published online by Cambridge University Press

Janowitz, B., Kane, T. T., Arruda, J. M., Covington, D. L. & Morris, L. (1986) Side effects and discontinuation of oral contraceptive use in southern Brazil. *Journal of Biosocial Science* **18**, 261–271.

Klitsch, M. (1991) In Sudan, fertility rates are high, but few plan to use contraceptives. *International Family Planning Perspectives* **17**(4), 156–157.

Loaiza, E. (1995) Sterilization regret in the Dominican Republic: looking for quality-of-care issues. *Studies in Family Planning* **26**(1), 39–48.

MEASURE *Evaluation* Project & Monitoring and Evaluation Subcommittee of the MAQ (2000) *Quick Investigation of Quality (QIQ), A User's Guide for Monitoring Quality of Care.* Carolina Population Center, Chapel Hill, NC.

Miller, R., Fisher, A., Miller, K., Ndhlovu, L., Maggwa, B. N., Askew, I., Sanogo, D. & Tapsoba, P. (1997) *The Situation Analysis Approach to Assessing Family Planning and Reproductive Health Services, A Handbook*. The Population Council, New York.

Ministry of Economics and National Planning & Macro International (1991) *Sudan Demographic and Health Survey 1989/1990*. Ministry of Economics, Khartoum, Sudan and National Planning and Macro International, Inc., Columbia, MD.

Ministry of Health, Kingdom of Morocco & The EVALUATION Project/Tulane University (1998) *The Dynamics of the Moroccan Family Planning Program*. The EVALUATION Project Carolina Population Center, Chapel Hill, NC.

National Academy of Sciences (1993) *Factors Affecting Contraceptive Use in Sub-Saharan Africa*. National Academy Press, Washington.

National Statistical Office (Malawi) & ORC Macro (2001) *Malawi Demographic and Health Survey 2000*. National Statistical Office, Zomba, Malawi, and ORC Macro and Calverton, MD, USA.

Page, H. J. & Lesthaeghe, R. (1981) *Child-Spacing in Tropical Africa: Tradition and Change.* Academic Press, New York.

Pan American Health Organization (PAHO) (1998) Cuba. *Health in the Americas* **2**, 206–219.

Pariani, S., Heer, D. M. & Van Arsdol Jr, M. D. (1991) Does choice make a difference to contraceptive use? Evidence from East Java. *Studies in Family Planning* **22**(6), 384–390.

Popov, A. A. (1993) A short history of abortion and population in Russia. *Planned Parenthood in Europe* **22**(2), 23–25.

Popov, A. A. & David, H. P. (1999) Russian Federation and USSR Successor States. In David, H. P. & Skilogianis, J. (eds) *From Abortion to Contraception: A Resource to Public Policies and Reproductive Behavior in Central and Eastern Europe from 1917 to the Present*. Greenwood Press, Westport, CT, pp. 223–277.

Population Council (1999) Yemen 1997: Results from the Demographic and Health Survey. *Studies in Family Planning* **30**(4), 211–215.

Population Reference Bureau (PRB) (1999) *1999 World Population Data Sheet of the Population Reference Bureau: Demographic Data and Estimates for the Countries and Regions of the World.* Population Reference Bureau, Washington, DC.

Potter, J. E. (1999) Outmoded contraceptive regimes: the cases of Mexico and Brazil. *Population and Development Review* **25**(4), 709–739.

Rajaretnam, T. & Deshpande, R. V. (1994) Factors inhibiting the use of reversible contraceptive methods in rural south India. *Studies in Family Planning* **25**(2), 111–121.

Remez, L. (1993) Two in three Dominican women in union who use a method are sterilized. *International Family Planning Perspectives* **19**(1), 36–37.

Robey, B., Rutstein, S. O., Morris, L. & Blackburn, R. (1992) *The Reproductive Revolution: New Survey Findings.* Population Reports Series M, Number 11.

Ross, J. (1992) Sterilization: past, present and future. *Studies in Family Planning* **23**(3), 187–198.

https://doi.org/10.1017/S0021932005026647 Published online by Cambridge University Press

Ross, J., Hardee, K., Mumford, E. & Eid, S. (2001) Contraceptive method choice in developing countries. *International Family Planning Perspectives* **28**(1), 32–40.

Ross, J., Stover, J. & Willard, A. (1999) *Profiles for Family Planning and Reproductive Health Programs: 116 Countries.* The Futures Group International, Glastonbury.

Secretaria de Salud, México (2003) *Encuesta Nacional de Salud Reproductiva 2003.* Secretaria de Salud, Mexico City.

Shah, I. (1995) *Perspectives on Methods of Fertility Regulation, Past and Present Work by the Special Programme and Other Agencies: A Background Paper.* UNDP/UNFPA/WHO/World Bank Special Programme of Research, Development and Research Training in Human Reproduction.

Shah, N. M. & Kamel, S. M. (1985) Contraceptive use among women in Kuwait. *International Family Planning Perspectives* **11**(4), 108–112.

Swar-Eldahab, A. M. (1993) Constraints on effective family planning in urban Sudan. *Studies in Family Planning* **24**(6), 366–374.

Stewart, M. (1995) Many pill users in Egypt lack adequate knowledge about how to take the pill. *International Family Planning Perspectives* **21**(3), 123–124.

Storey, J. D., Ilkhamov, A., Pogrebov, I. & Jabre, B. (1994) *Clients' perspectives on contraceptive technology and practices in the Tashkent region of Uzbekistan.* Johns Hopkins Center for Communication Programs, Baltimore.

Swar-Eldahab, A. M. (1993) Constraints on effective family planning in urban Sudan. *Studies in Family Planning* **24**(6), 366–374.

Taha, T. E. T. (1993) Family planning practice in central Sudan. *Social Science and Medicine* **37**(5), 685–689.

Trottier, D. A., Potter, L. S., Taylor, B. A. & Glover, L. H. (1994) User characteristics and oral contraceptive compliance in Egypt. *Studies in Family Planning* **25**(5), 284–292.

United Nations Population Division (2003) *World Contraceptive Use 2003*. United Nations Population Division, New York.

UNFPA (1999) *Levels and Trends of Contraceptive Use as Assessed in 1998*. Department for Economic and Social Affairs, Population Division, United Nations, New York.

Warren, C. W., Oberle, M. W., Medica, W. & Morris, L. (1987) Contraceptive use and fertility in Panama, 1984. *International Family Planning Perspectives* **13**(2), 47–51.

Warren, C. W., Oberle, M. W., Morris, L. & Medica, W. (1988) Changes in contraceptive use and fertility, Panama, 1976 to 1984. *Social Biology* **35**(1–2), 74–81.

Way, A. A., Cross, A. R. & Kumar, S. (1987) Family planning in Botswana, Kenya and Zimbabwe. *International Family Planning Perspectives* **13**(1), 7–11.

Westoff, C. F. (2000) *The Substitution of Contraception for Abortion in Kazakhstan in the 1990s.* DHS Analytical Studies No. 1., ORC Macro, Calverton, MD.

https://doi.org/10.1017/S0021932005026647 Published online by Cambridge University Press