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Family planning, antenatal and delivery care: cross-sectional survey evidence on levels of coverage and inequalities by public and private sector in 57 low- and middle-income countries

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Abstract

OBJECTIVE The objective of this study was to assess the role of the private sector in low- and middle-income countries (LMICs). We used Demographic and Health Surveys for 57 countries (2000–2013) to evaluate the private sector's share in providing three reproductive and maternal/newborn health services (family planning, antenatal and delivery care), in total and by socio-economic position.

METHODS We used data from 865 547 women aged 15–49, representing a total of 3 billion people. We defined 'met and unmet need for services' and 'use of appropriate service types' clearly and developed explicit classifications of source and sector of provision.

RESULTS Across the four regions (sub-Saharan Africa, Middle East/Europe, Asia and Latin America), unmet need ranged from 28% to 61% for family planning, 8% to 22% for ANC and 21% to 51% for delivery care. The private-sector share among users of family planning services was 37–39% across regions (overall mean: 37%; median across countries: 41%). The private-sector market share among users of ANC was 13–61% across regions (overall mean: 44%; median across countries: 15%). The private-sector share among appropriate deliveries was 9–56% across regions (overall mean: 40%; median across countries: 14%). For all three healthcare services, women in the richest wealth quintile used private services more than the poorest. Wealth gaps in met need for services were smallest for family planning and largest for delivery care.

CONCLUSIONS The private sector serves substantial numbers of women in LMICs, particularly the richest. To achieve universal health coverage, including adequate quality care, it is imperative to understand this sector, starting with improved data collection on healthcare provision.

keywords maternal heath, family planning, antenatal care, delivery care, Demographic and Health Surveys, private sector

Introduction

The private sector is an important source of healthcare provision in low- and middle-income countries (LMICs). For maternal/newborn health in particular, and to a lesser extent for family planning, little is known about the services provided by private healthcare providers [1, 2], but there is a growing interest in understanding their role [3, 4].

Views about the role of the private sector in healthcare provision tend to be polarised [5, 6], with claims and counter-claims of ideological bias, selective use of evidence and conflicts of interest [6–11]. Some are enthusiastic about the private sector's potential to contribute

to international coverage and equity objectives. They point to evidence that the private sector is more responsive to patient preferences and more convenient and may be better equipped, supplied or trained [12]. Others are more sceptical, particularly about the role of for-profit private providers, and are concerned about the presence of unqualified providers, the financial incentives for overprovision of tests or services [5, 13] and the potentially impoverishing impact of out-of-pocket payments [14, 15].

Although these debates on the comparative quality, costs and efficiency of the sectors are influenced by differing ideological and political perspectives [5], their persistence is fuelled by conflicting evidence and interpretations of the role played by the private sector. The magnitude of the private sector and the degree to which it serves various socio-economic groups are contested. There are sweeping claims that the private sector is the main, and growing, provider of primary healthcare in many LMICs [12, 16]; yet, the data underlying such claims often centre on a specific service for a specific population segment [16–18]; are for a selected set of countries [19–21]; or are aggregated across countries without weighting for population [22]. Some commentators report that the poor are as likely to use the private sector as the better-off [2, 6, 18]; others find that the private sector predominantly serves richer groups [7, 23].

There are methodological challenges to quantifying the role of the private sector, which is highly diverse, with variations in profit orientation, size (from individual practitioners to complex organisations) and level of provider training (unqualified, qualified but acting outside their scope of practice, or fully qualified) [6, 13, 24]. Calculating the private sector's share of provision is sensitive to the definition of the private sector. One report considers only those seeing a private doctor and finds this to be higher among the richer quintiles [7]; another considers all private providers, including pharmacies and drug shops [6]. Comparability of estimates is difficult due to inconsistencies in provider response options on surveys [1, 25, 26]. In addition, there are specific challenges that apply to family planning and maternal/newborn health services, including whether certain types of care should be included in estimates of service provision (for example folk methods of family planning or delivery by an unskilled attendant) [27, 28].

This paper comprehensively and transparently assesses the role of the private sector in providing reproductive and maternal/newborn health services, and compares it across LMIC regions and countries, and socio-economic groups.

Methods

Data

The Demographic and Health Surveys (DHS) are cross-sectional, nationally representative household surveys [29]. We used the most recent DHS conducted between 2000 and mid-2013 from 57 countries (Appendix S1). Respondents are either ever-married or all women of reproductive age (15–49 years). The DHS use a multilevel cluster sampling survey design; individual women's survey weights are needed in analysis to adjust for this and for non-response.

Definitions

Populations and women in need of healthcare services. For the three healthcare services under consideration, we looked at three populations: (i) all surveyed women; (ii) all women 'in need' of family planning, antenatal (ANC) or delivery care, termed 'women in need of services'; and (iii) all users of 'appropriate service types', termed 'women with met need for appropriate services'. Women in need indicate the size of the potential market, while women who use appropriate service types are the denominator for estimating market share by sector (definitions and categories are detailed in Table 1). 'Women in need' of ANC or delivery-care services were those with a birth in the survey recall period. Ten countries did not ask ANC questions and were consequently excluded from the ANC analyses. ANC information was requested only for the most recent birth in the recall period. We used this birth for the delivery-care analysis as well (and included the most recently listed child for multiple births), so as to be comparable to the ANC analyses. Defining 'women in need' of family planning was more complex. We sought to exclude both women who could not get pregnant (e.g. were menopausal) and women who wanted to get pregnant, and operationalised need using a recently updated consensus definition [30]. All women/couples using any method were classified as 'in need'.

Receipt of appropriate service types. We considered women to have received an appropriate service type (i.e. to have met need for appropriate services) if their care complied broadly with what is understood to be an effective service, without wishing to imply that the actual care received was appropriate in terms of its quantity or quality (Table 1). Nearly all the literature on sector of provision of family planning explores the use of modern methods, irrespective of the provider source. We adopted this convention. The literature on delivery care typically

Table 1 Classification of sources of provision by appropriateness of the service type and by sector for each healthcare service, with examples† of DHS response options

	Family planning	ANC	Delivery care
Use among women who need service			
Did not use any service	Did not use any method	Did not use ANC	Not applicable
Did not use an appropriate service type	Used a traditional method (such as withdrawal, abstinence, and folkloric methods (i.e. use of herbs)), lactational amenorrhoea method (LAM) or fertility awareness methods	Not applicable	Delivered without assistance of skilled birth attendant (a doctor, nurse, midwife or auxiliary midwife) in a non-facility location (at home or in a traditional birth attendant's home, or in another location that is not a facility)
Used an appropriate service type	Used any modern contraceptive method (current use of male and female condoms, diaphragm, foam/jelly, oral contraceptive pills, emergency contraception, injectables, implants, intrauterine devices, and female or male sterilisation) except LAM or fertility awareness	Used one or more ANC locations OR contact with ANC persons/ professionals OR at least one ANC visit‡	Delivered in a facility OR delivered assisted by a skilled birth attendant
Sector of service			
Used an appropriate service type; classifiable sector of provision	Used modern contraception and reported a service location other than husband/friend/ relatives/providers abroad	Used an appropriate (any) service and reported a service location other than respondent's home, traditional birth attendant's home, other home	Used an appropriate service and reported a service location in the private or public sector
Used appropriate, classifiable service: *public sector*	Service location: all government/ public service locations at all levels (e.g. hospitals, polyclinics, doctors' offices, women's health centres, family planning clinics, public community health workers, mobile clinics and dispensaries)	Service location: all government, public or social security service locations at all levels, whether institutional (e.g. public provincial/district/referral/rural hospital, public health centre, public polyclinic/woman's consultation, public health unit, public health post/clinic, dispensary, maternal clinic, maternity home) or a non-institutional location with a known sector (e.g. public midwife, ambulatory health professional, public community health worker)	Service location: public-sector facility or with a public skilled birth attendant (with location responses such as public health professional, public ambulatory health professional or public other)
Used appropriate, classifiable service: *private sector*	Service location: all private providers including NGO-based and faith-based providers and non-medical vendors (e.g. shops, pharmacies, drug sellers, nightclubs)	Service location: all private institutions (e.g. hospital/clinic, maternity clinic/hospital, health centre, faith-based or missionary hospital, health centre, health post/dispensary, NGO clinic/ hospital) or non-institutional providers with known sector (e.g. private midwife, private doctor)	Service location: private-sector facility or with private skilled birth attendant (with location response as private doctor, private midwife, private health professional, private other)

Table 1 (*Continued*)

	Family planning	ANC	Delivery care
Used an appropriate service type; sector of provision not classifiable	Used a modern method and reported a missing source location or obtained a method from husband/friend/relatives/ providers abroad	Used ANC with missing service location or in respondent's home, traditional birth attendant's home, other home	Delivered with a skilled birth attendant but at a location that is not classifiable by sector (at home or another's home or at another location that is not a facility)

NGO, non-governmental organisation.
†There were large numbers of unique response options across the 57 surveys: 141 family planning providers, 79 ANC locations, 52 persons providing ANC, 50 delivery locations and 91 persons conducting deliveries, so only examples are shown [26].
‡Some home-based ANC services could have been provided by traditional healers and potentially should not have been classified as an appropriate service type, much as delivery by a relative or TBA in home environments was excluded as an appropriate service type for delivery care. However, we had no basis for systematically excluding any particular person providing ANC.

examines either facility births or births with skilled attendants, but rarely both together. We considered women to have received appropriate delivery-care type either if they delivered in a health facility or with a skilled birth attendant (doctor, nurse, midwife or auxiliary midwife). Women delivering at home or in other places with a relative or alone, or with a traditional birth attendant, were considered to have received an inappropriate service type. We defined an appropriate service type for ANC as receipt of any ANC, irrespective of location and professional. We did not require a specific level of clinical training for providers, since individuals with less training can deliver ANC [31]. We chose to use the Millennium Development Goals (MDG) and WHO indicator of 1 + (any) ANC visits rather than others [32, 33].

Categorisation of source and sector of provision. Our approach to classifying providers used two key dimensions: providers' clinical nature/skills and profit motive (Table 1); thi is also detailed in Footman *et al.* [26] Women could report more than one ANC provider. ANC services received exclusively from one or more public providers, or from public providers and at home were described as public; the same was done for private providers. Women who obtained ANC exclusively at home were described as such. A combination (public and private) category was used for those receiving care from both public and private providers and is shown separately in figures. In coverage estimates, it was included with the private sector.

Categorisation of geographic regions. We used four regions (sub-Saharan Africa, North Africa/West Asia/ Europe, South/South-East Asia and Latin America and the Caribbean), following Montagu *et al.* [34] For simplicity, we refer to these regions as sub-Saharan Africa, Middle East/Europe, Asia and Latin America. To create pooled estimates of data, we weighted each country's results by its total population size, using 2008 United Nations (UN) Population Estimates [35]. Countries without DHS data were not included in the regional weighting.

Categorisation of socio-economic position for equity analysis. We stratified the data by quintile of asset ownership in women's households, termed wealth quintiles [36, 37].

Analysis

In general, the DHS have few missing data, well below 1%. Our treatment of missing and unclassifiable sector data is detailed in Table 1 and Appendix S2. Analyses were conducted in Stata/SE v.13.

Ethical approval

The DHS receive government permission and follow ethical practices including informed consent and assurance of confidentiality. The Research Ethics Committee of the London School of Hygiene and Tropical Medicine approved our secondary-data analysis.

Results

Included surveys provided data on 865 547 women for the family planning and delivery-care analyses, representing a total population of 3 billion people (Table 2). For the ANC analysis, there were 757 339 women in 47 countries that represented 2.7 billion people. Table 3 summarises the range of findings across regions and countries.

Table 2 Geographic regions and percentage of their populations covered by the DHS surveys included in the analysis

Region	UN subregions included	Total population in region, 2008 (millions)†	% of population of region covered by DHS surveys‡	Number of countries in region	Number of countries covered: family planning (FP) and delivery-care services	Number of countries covered: ANC services
Sub-Saharan Africa	Eastern Africa, Middle Africa, Southern Africa, Western Africa	788	83% (FP and delivery) 68% (ANC)	51	30	23
Middle East/Europe	Northern Africa, Western Asia, Eastern Europe, Southern Europe	864	29% (FP and delivery) 25% (ANC)	51	9	8
Asia	Southern Asia, South-Eastern Asia	2220	88% (FP and delivery) 84% (ANC)	20	10	9
Latin America	Caribbean, Central America, South America	583	20% (FP and delivery) 19% (ANC)	48	8	7

†UN Population Estimates (2008).
‡Assuming DHS are nationally representative for each country.

Table 3 Summary of need, use, and sector of use for family planning, ANC, and delivery-care services across regions (including overall weighted mean of regions) and countries (median and range)

	Sub-Saharan Africa	Middle East/Europe	Asia	Latin America	Overall weighted mean of regions	Median (range) across countries
Need for service among all women (%)						
Family planning	39	63	58	60	54	50 (24–80)
ANC	52	36	36	31	39	44 (16–61)
Delivery care	53	35	36	32	39	46 (16–68)
Use of appropriate service types among women in need (%)						
Family planning	39	64	67	72	63	46 (6–84)
ANC	78	81	78	92	79	96 (43–100)
Delivery care	49	84	49	79	53	68 (12–100)
Use of private-sector service among women in need (%)						
Family planning	14	23	24	27	22	16 (2–55)
ANC	12	49	40	12	32	13 (0–74)
Delivery care	10	26	23	7	19	9 (0–46)
Use of appropriate, unclassifiable sector service among women in need (%)						
Family planning	3	2	3	2	3	2 (0–12)
ANC	2	<1	7	<1	5	1 (0–18)
Delivery care	3	5	8	3	6	2 (0–19)
Use of private-sector service among women using services with a classifiable sector (%)						
Family planning	38	37	37	39	37	41 (6–80)
ANC	16	61	55	13	44	15 (0–77)
Delivery care	22	33	56	9	40	13 (0–77)

Figure 1a illustrates need for and use of family planning among all women, by region. Figure 1b shows similar results by wealth quintile. Figure 1c,d shows family planning by sector of healthcare provision among women in need, for each of the regions in total, and by wealth quintile, respectively. Figures 2a-d and 3a–d show the corresponding data for ANC and delivery care, respectively.

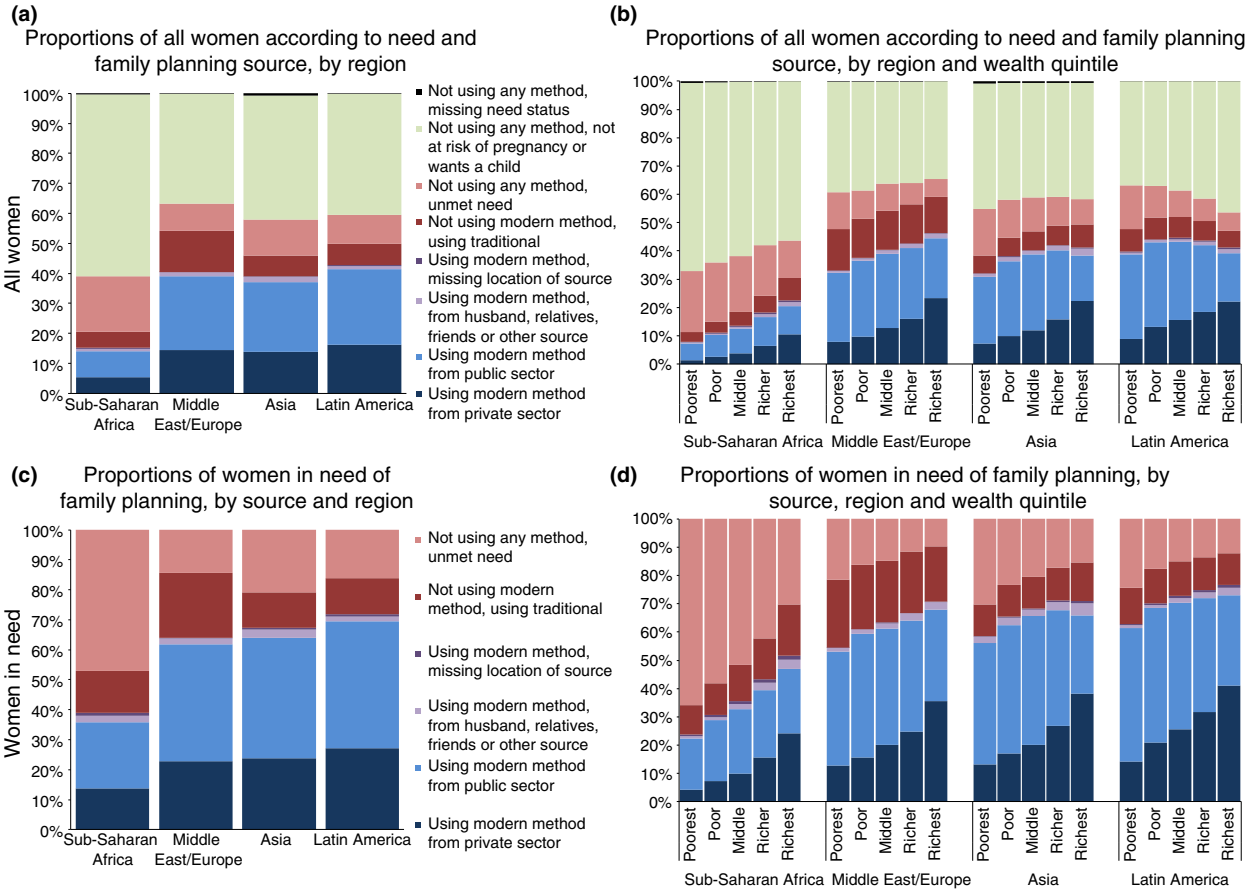


Figure 1 Family Planning: Proportions of women according to need and source.

Met and unmet need among women who need services

The percentages of women in need who were using appropriate services are shown in Table 3. Unmet need for family planning was highest in sub-Saharan Africa (61%), while unmet need for ANC was highest in sub-Saharan Africa and Asia (both 22%), as was unmet need for appropriate delivery care (both 51%). Figure 4a–c shows met need by each sector for individual countries. They show that regional averages conceal considerable variability by country.

Private sector use

Among women in need. The private sector served 14% of women in need of family planning in sub-Saharan Africa compared with about a quarter in the other three regions (Table 3 and Figures 1c, 2c, and 3c). Use of private-sector ANC among women in need ranged from 12% in sub-Saharan Africa and Latin America to 49% in the Middle East/Europe. A small percentage of women in need used a combination of both private and public ANC sources: sub-Saharan Africa 1%, Middle East/Europe 6%, Asia 3% and Latin America 2%. Use of private-sector delivery care among women in need was as follows: sub-Saharan Africa 10%, Middle East/Europe 26%, Asia 23%, and Latin America 7%.

Family planning, ANC and delivery care estimates assumed women with an unclassified sector obtained their service from the public sector, potentially underestimating private-sector use. A sensitivity analysis (assuming the unclassified sector was private) giving the upper bound (or overestimate) for the private sector is in Appendix S3. It shows an increase of 3% for family planning, 7% for ANC, and 8% for delivery care in Asia, and <1% to 5% for the three healthcare services in the other three regions.

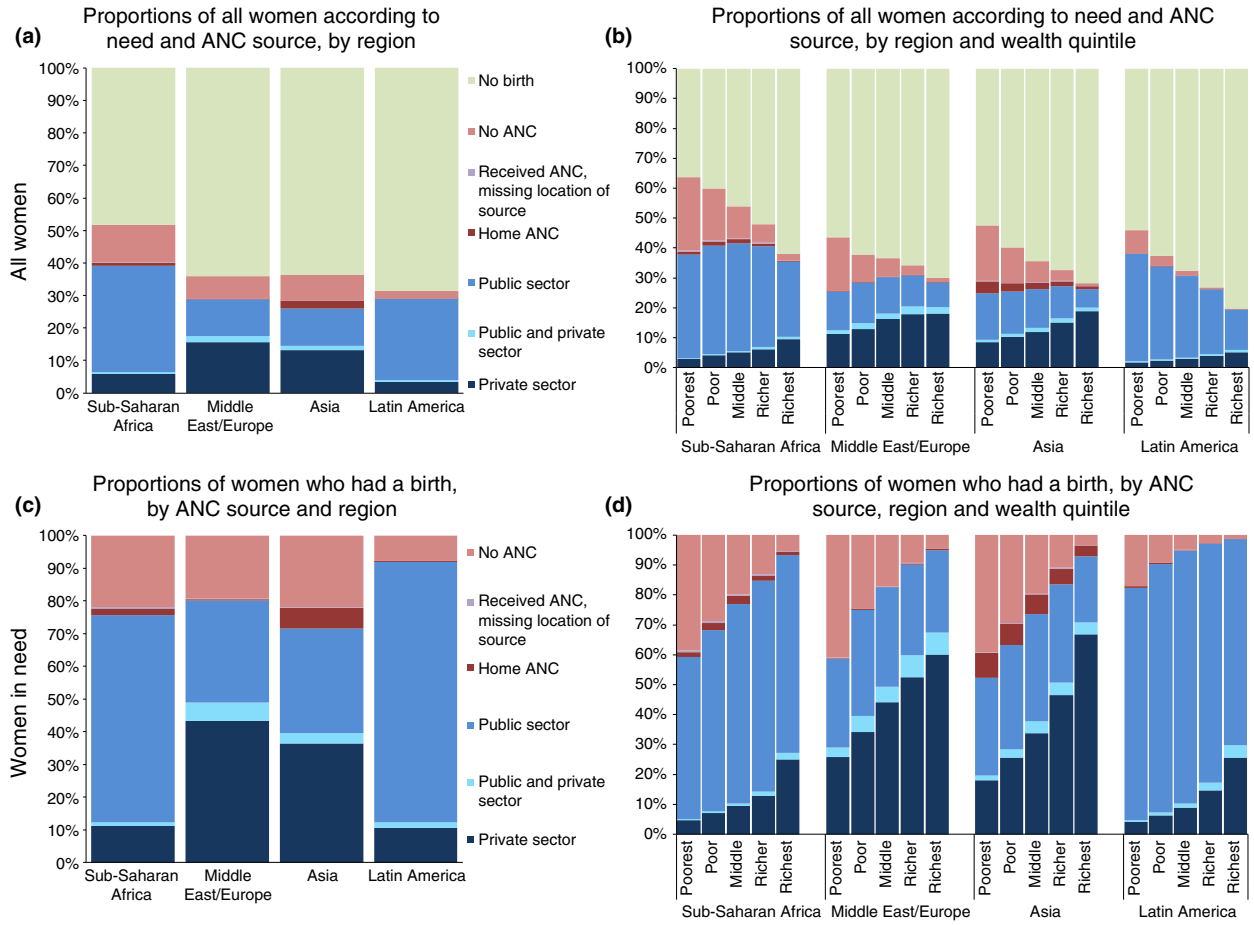


Figure 2 Antenatal care: Proportions of women according to need and source.

Among service users with a classifiable sector. Among modern contraceptive users, the private-sector market share was remarkably similar across regions: Middle East/Europe and Asia 37%, sub-Saharan Africa 38% and Latin America 39%. In contrast, there was substantial heterogeneity in private-sector use across regions for ANC and delivery care. Among users of ANC, those with private or combination public-/private-sector use ranged across regions from 13% (Latin America) to 61% (Middle East/Europe). Among women who used an appropriate delivery service with a classifiable sector (Table 3), the private-sector market share ranged from 9% (Latin America) to 56% (Asia).

Inequality

Met and unmet need. Figure 5 shows met need among the richest and poorest quintiles of women in need of services, and demonstrates the service coverage gap, which was smallest for family planning and largest for delivery care. Sub-Saharan Africa had the largest gap for family planning services, while Asia had the largest gaps for ANC and delivery care.

Private-sector use among women in need. In all regions, wealthier women more likely than poor women to use private providers for modern contraceptives. Figure 1d shows that the public sector compensated somewhat for the inequalities in private provision, favouring the poor. The exception was sub-Saharan Africa, where the inequalities in service use and in private-sector use were equally steep. The gradients for private-sector ANC use increased steeply with wealth in all regions (Figure 2d). When compared to the gradients for overall ANC use, they were parallel or steeper, except for sub-Saharan Africa. These varying patterns reflect the different contribution of the public sector to attenuating or exacerbating the gradient in use. The gradients for private-sector provision of appropriate delivery

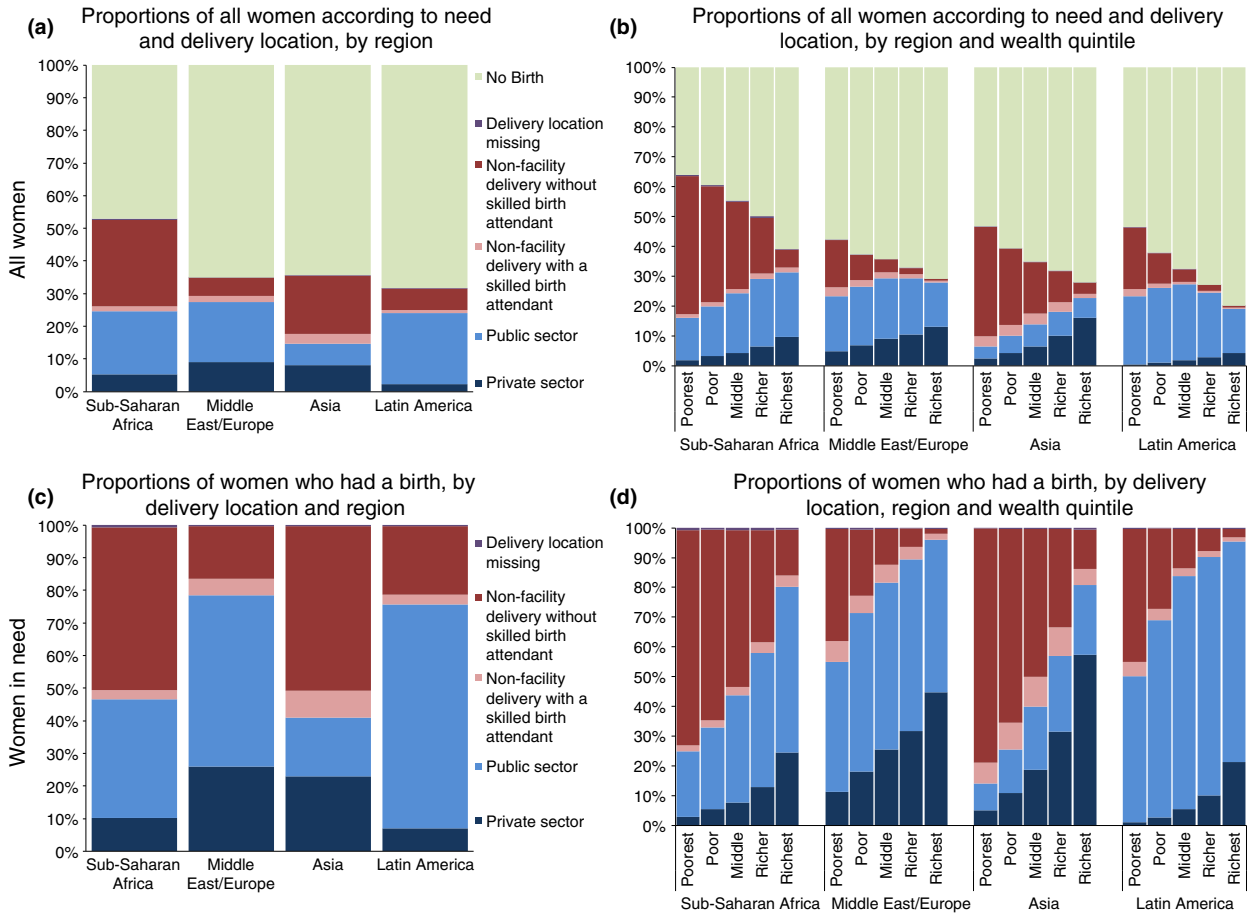


Figure 3 Delivery care: Proportions of women according to need and source.

care increased very steeply with wealth in all regions, but were less steep than the overall appropriate delivery-care provision. This indicates that the richest used both sectors more than the poorest (Figure 3d).

Figure 6 shows the gaps in met need in percentage points between the poorest and the richest quintiles, stratified by sector. A positive percentage denotes a greater use of a healthcare service by the poorest than the richest, whereas a negative percentage means the opposite. In all regions except for sub-Saharan Africa, the use of public-sector family planning and ANC services were similar or higher among the poorest compared to the richest, while private family planning and ANC services were higher among the richest. Such patterns mean the public sector attenuated the gradient seen in private-sector service use. In all regions, both public- and private-sector delivery care favoured the richest. Figure 7a–c shows rich–poor gaps by sector for individual countries for family planning, ANC and delivery care, respectively.

Discussion

Just over a quarter of the world's population in 2015, an estimated 1.86 billion women, are women of reproductive age, 85% of whom live in LMICs [35]. Our analysis provides a comprehensive evaluation of private sector's role in providing family planning and maternal/newborn services to such women. Compared to the literature, our study: (i) included the largest number of countries; (ii) clearly delineated who needed services; (iii) defined an 'appropriate service type'; (iv) transparently handled unclassifiable and missing data; (v) captured regional and country variation; (vi) obtained 'best estimates' of coverage by sector; and (vii) assessed inequalities in appropriate service type use and private-sector use.

Sweeping statements about coverage or socio-economic inequality would mask the considerable diversity seen between countries. Nevertheless, we found that substantial proportions of women accessed no service: neither

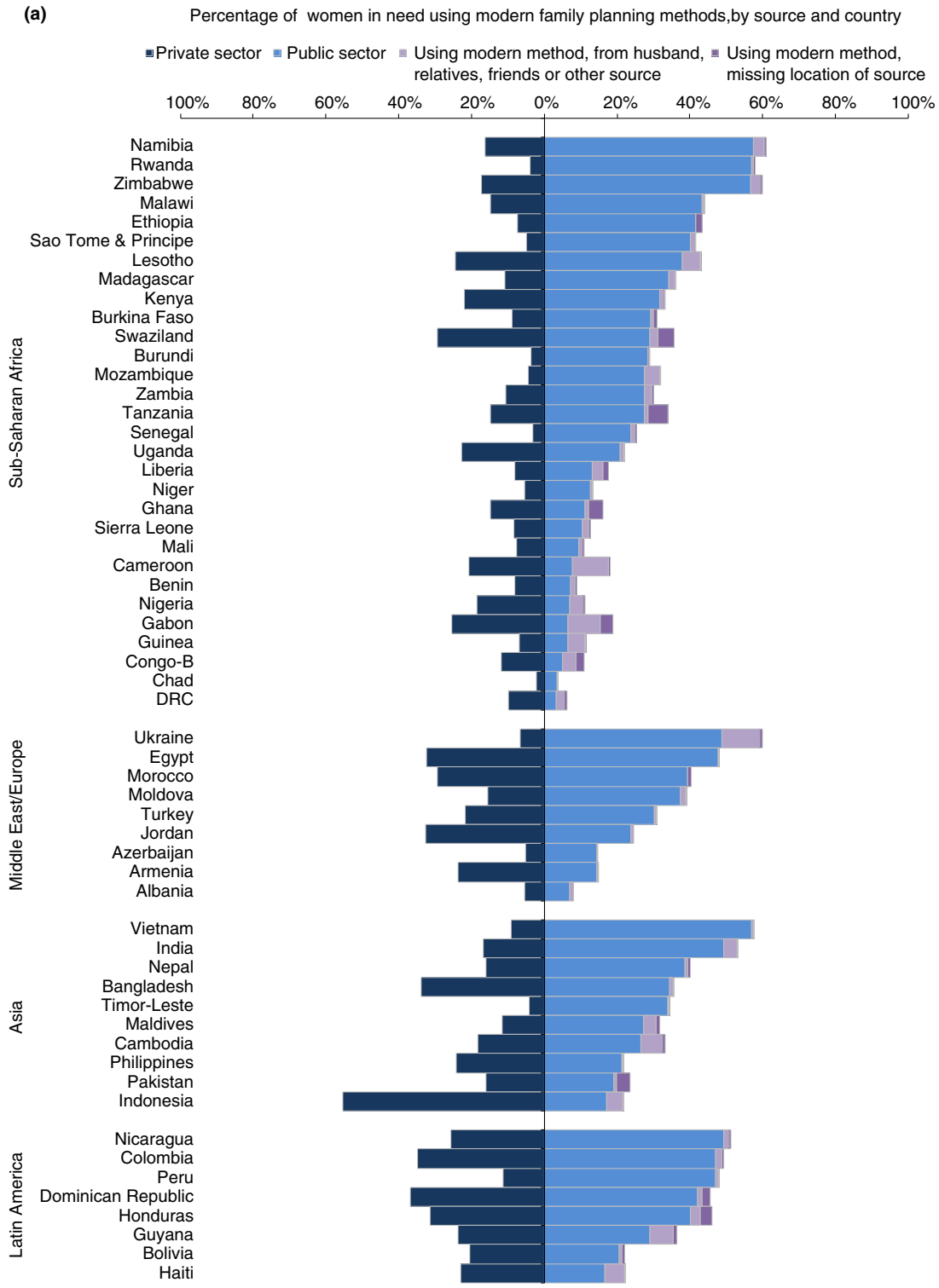
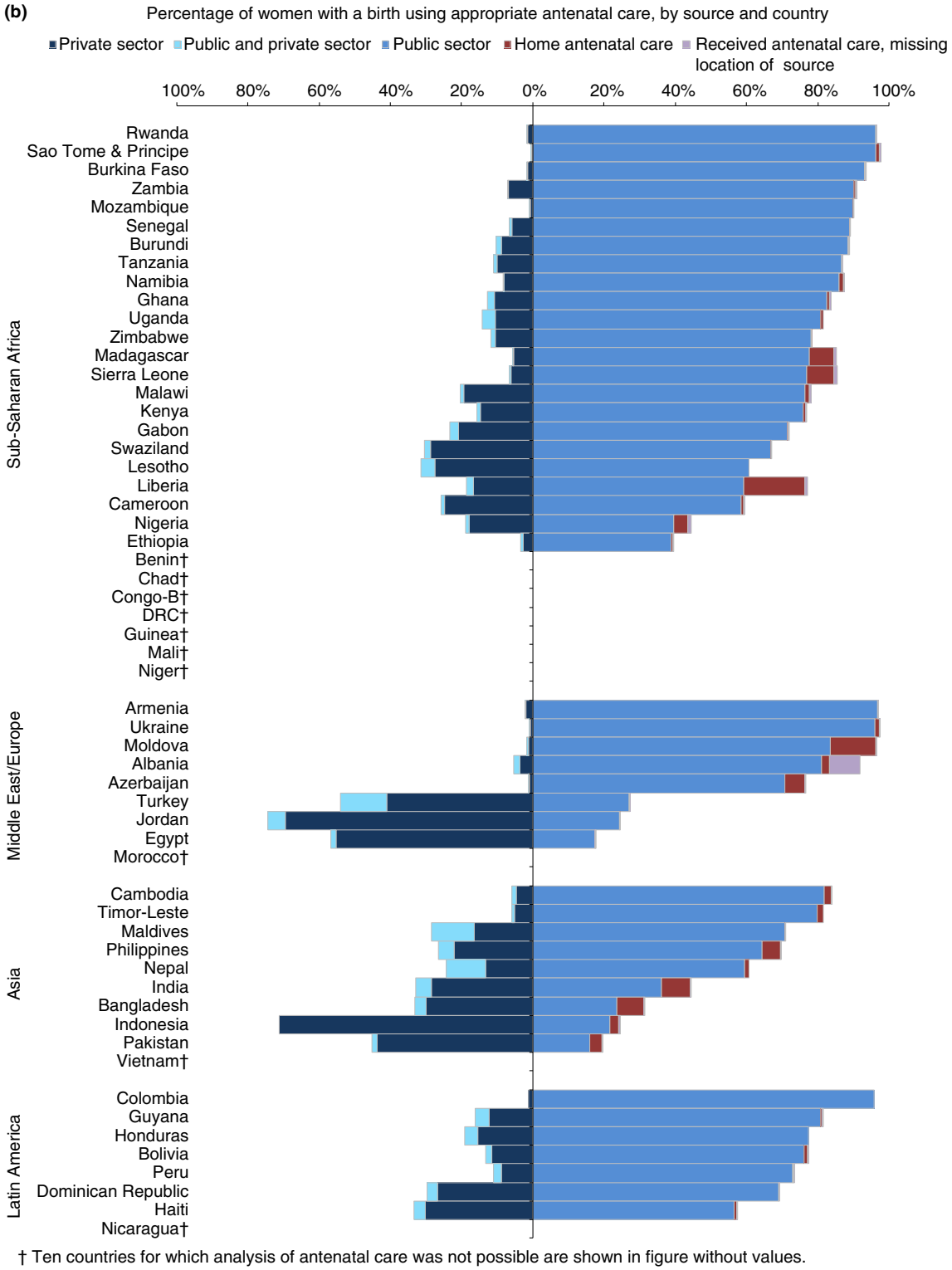


Figure 4 Appropriate service type, by source and country for (a) Family planning. (b) Antenatal care. (c) Delivery care.



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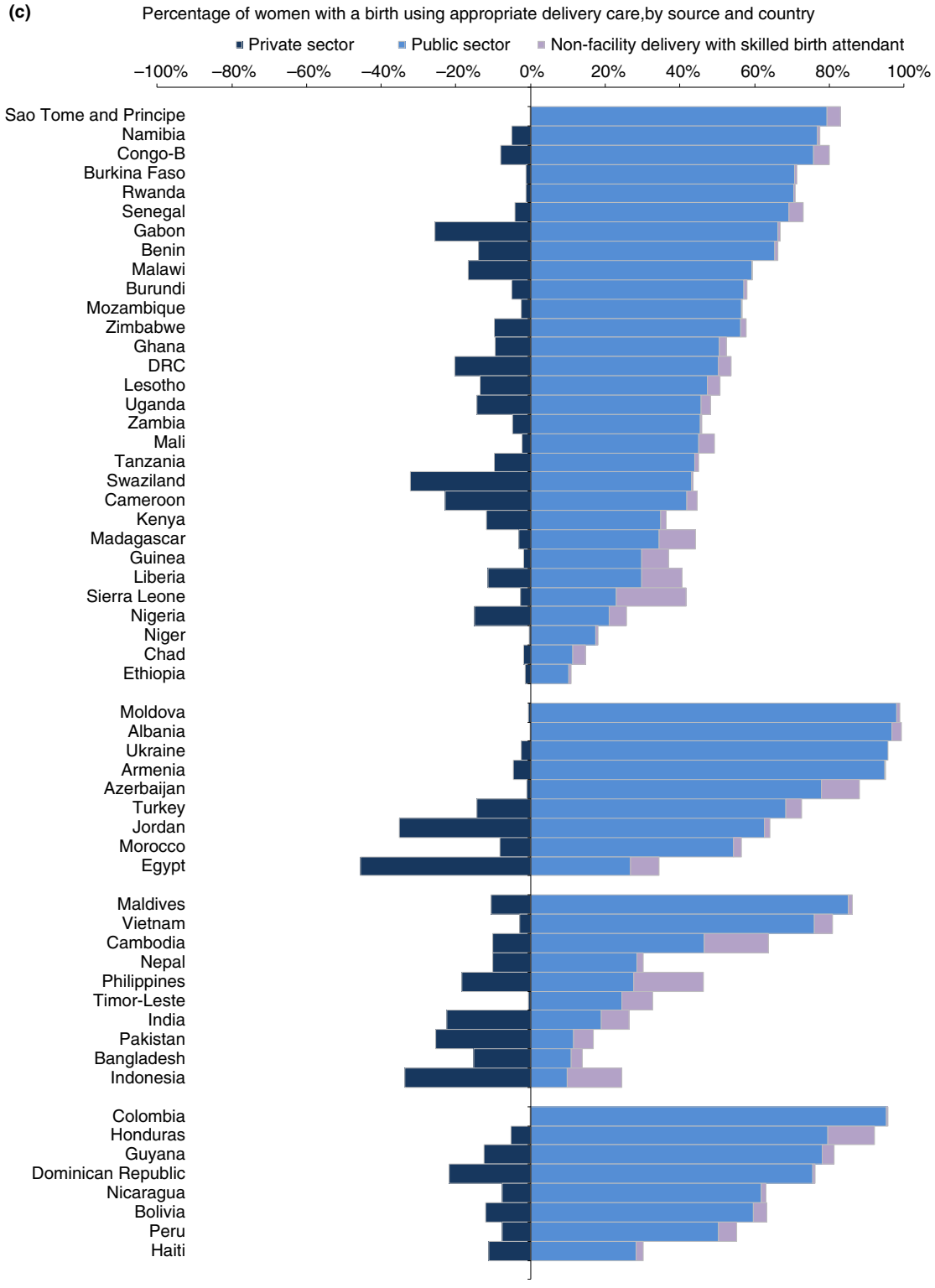

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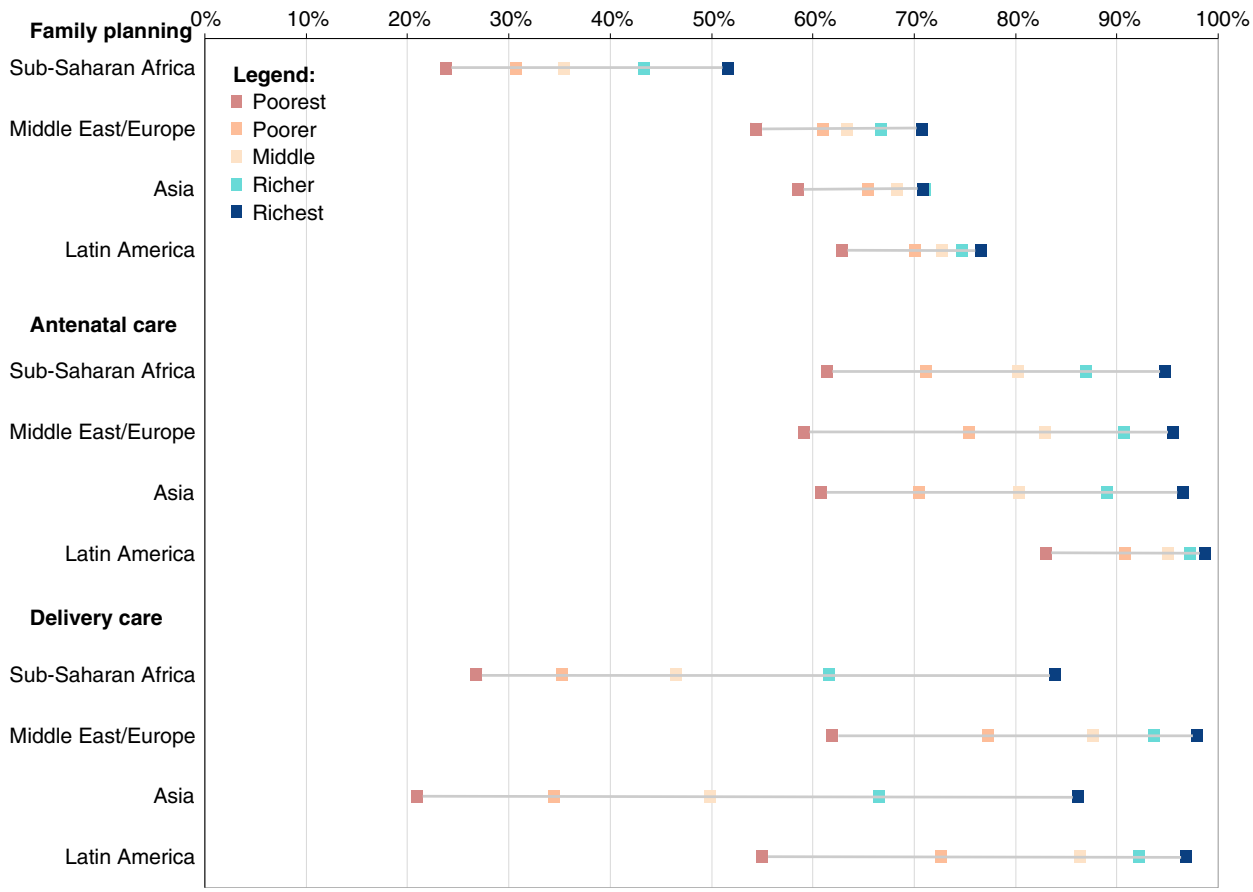


Figure 5 Wealth quintile gaps in met need for appropriate reproductive and maternal services among women with need.

public- nor private sector. At the end of the MDG-era, median unmet need across countries was 54% for family planning, 4% for ANC and 32% for delivery care, despite these services having been declared global and national health priorities. Private-sector provision of family planning and maternal/newborn care services was substantial, serving between 22% and 32% of women in need and two-fifths of users, with variation across the regions (family planning: 37–39%, ANC: 13–61%, delivery: 9–56%). The private-sector market share was nevertheless smaller than the figures sometimes quoted showing the private sector providing the majority of care [16, 18, 27, 28]. We also showed a relatively negligible contribution of government community health workers to family planning and ANC; and of NGO and FBOs to all three services.

We found the private sector consistently favoured the richest in all regions and services. This finding differs from some other reports [2, 27], primarily because they included services we excluded from our 'appropriate service types'. We found that the public sector was also used more by the richest than the poorest for many countries and services, although the distribution of services across wealth quintiles tended to be more equitable in the public than in the private sector. This confirms that the public sector does not always provide a safety net for the poor. For delivery care in particular, the public sector exacerbated rather than redressed pro-rich differences in coverage.

Limitations

We reiterate the strengths of our analyses, which include careful application of definitions and sensitivity analyses, but acknowledge that our study has some limitations. The data pertain to three healthcare services and the results should not be used to make broad statements about healthcare provision in general. Our results do not represent entire regions, particularly for Latin America and the Middle East/Europe, because the countries included relied on availability of recent DHS. Furthermore, some surveys date back as far as 2000 and there may have been important coverage

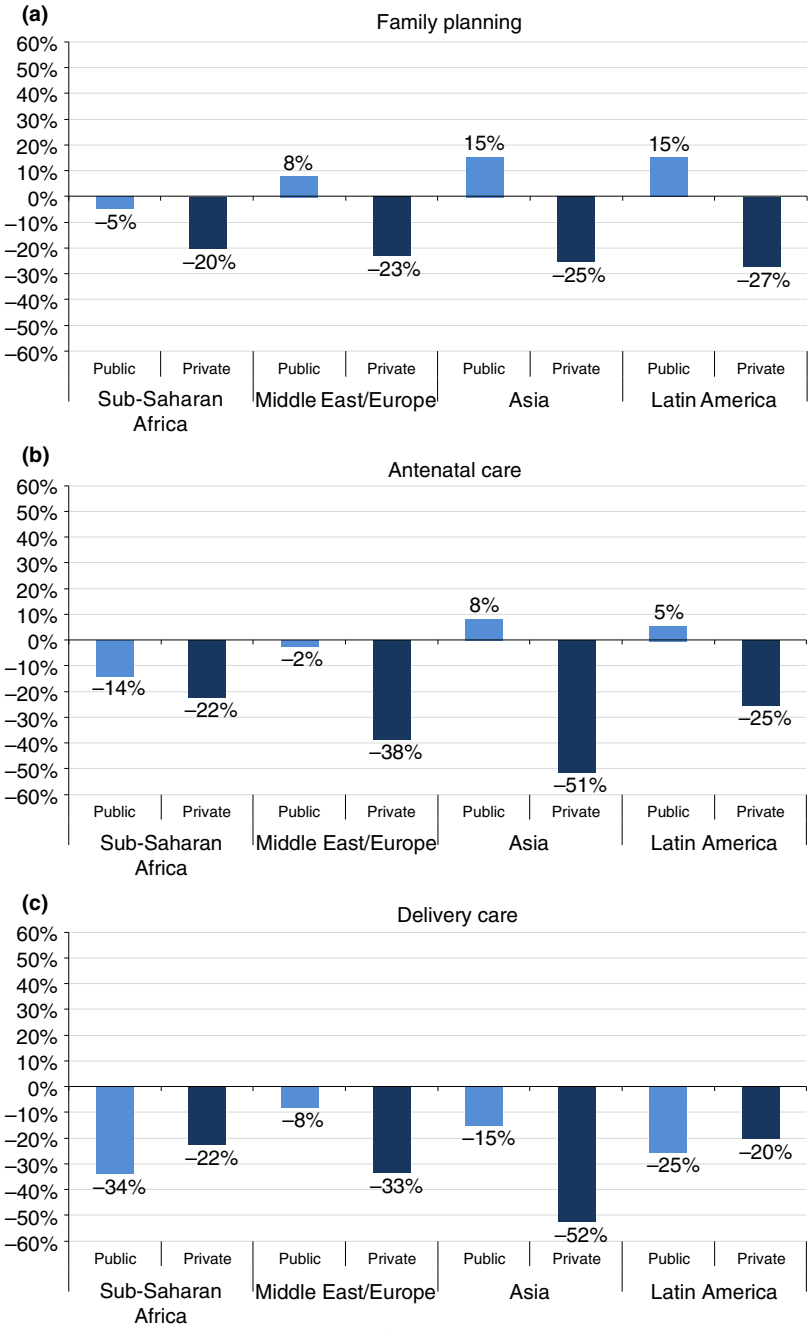


Figure 6 Absolute gap (difference in % points) between the poorest and richest quintiles (% using appropriate service type by sector, among women in need). (a) Family planning. (b) Antenatal care. (c) Delivery care.

changes in recent years. Other limitations are those inherent in using household-level survey data based on women's self-reports of provider source, and in the difficulties of working with questionnaires from 57 surveys [26]. Finally, most DHS exclude pregnancies that end in pregnancy losses, so the need for care may be underestimated.

Conclusion

We show that in the countries we studied, there is a considerable requirement to expand healthcare services if women's needs are to be met, and this is more acute for the poorest women, particularly in sub-Saharan Africa

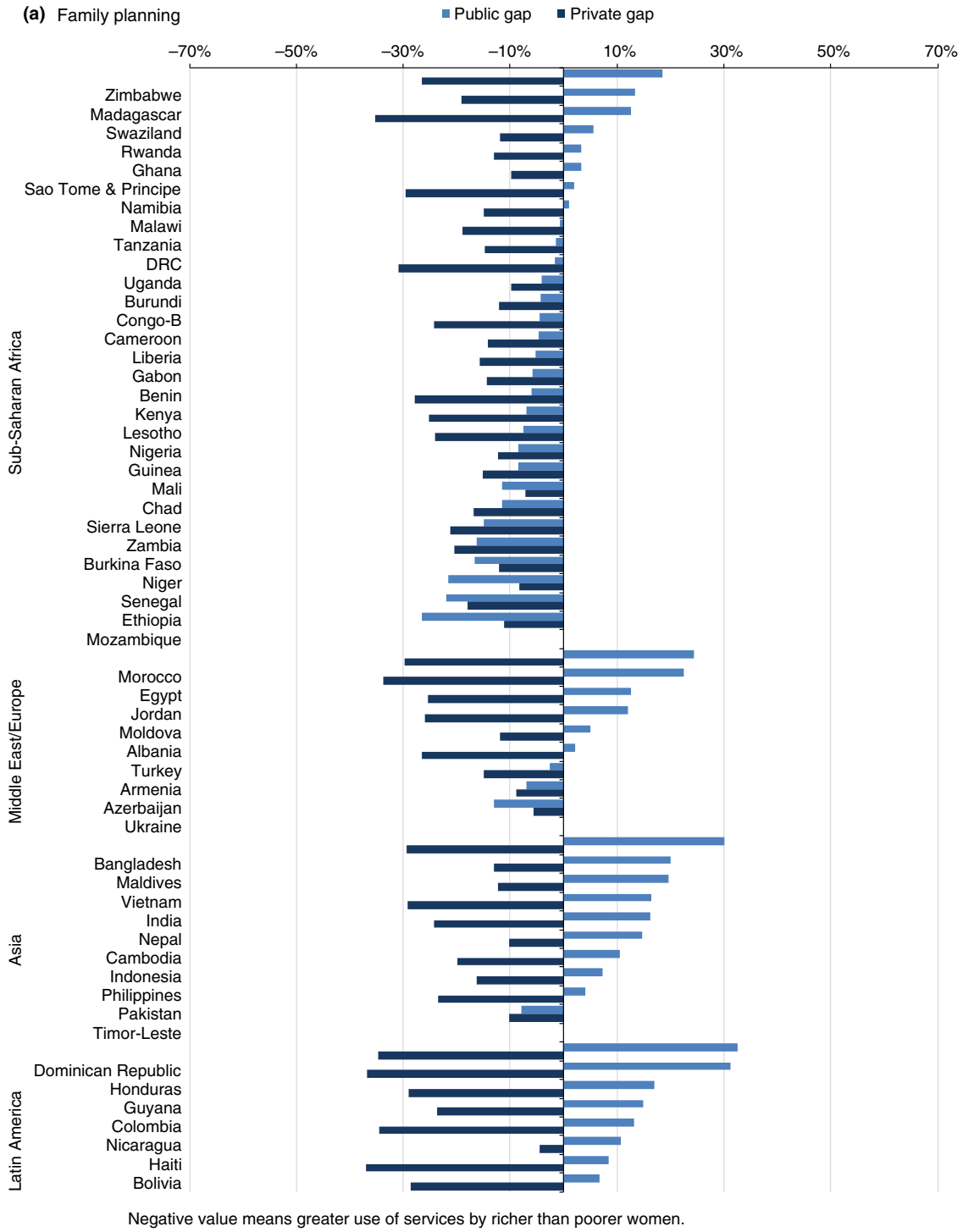
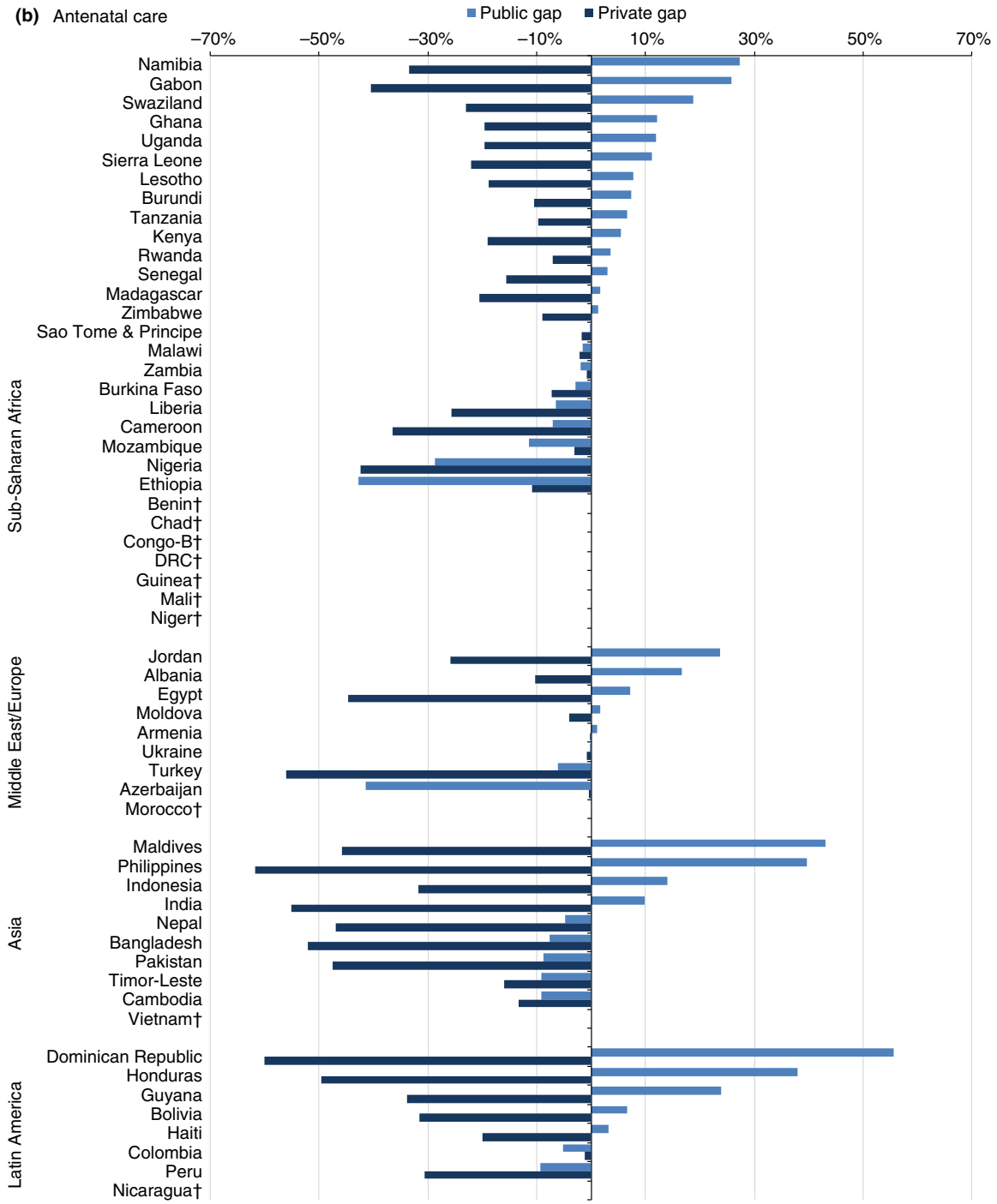


Figure 7 Absolute gaps (difference in % points) between the poorest and richest quintiles (% using appropriate services by sector, among women in need), by country. (a) Family planning. (b) Antenatal care. (c) Delivery care.



† Ten countries for which analysis of antenatal care was not possible are shown in figure without values.

Negative value means greater use of services by richer than poorer women.
Users of both public and private sectors appear in both categories.

Figure 7 Continued.

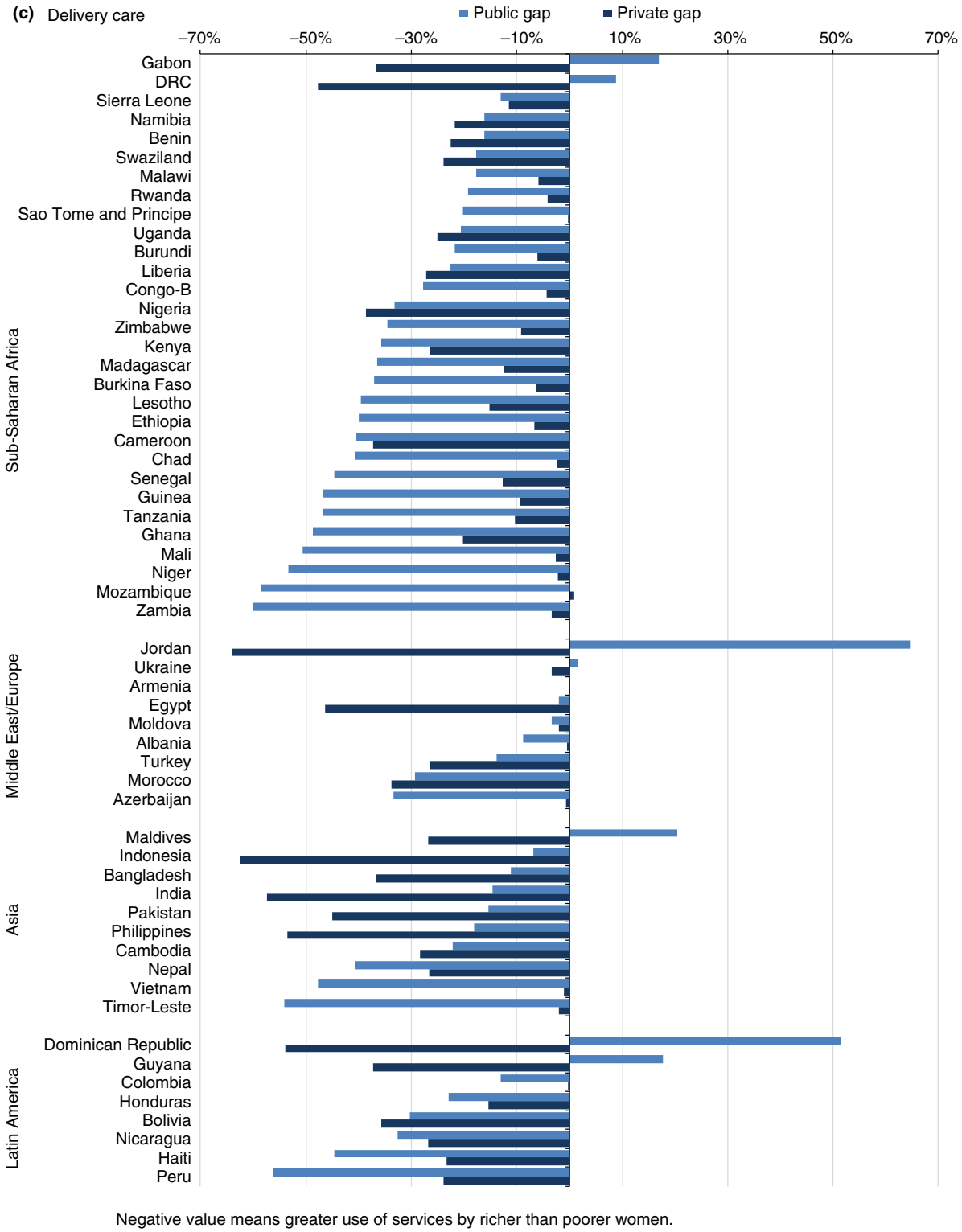


Figure 7 Continued.

and Asia. A considerable proportion of women in LMICs that used appropriate family planning, ANC or delivery care received services from private-sector providers, a diverse range of individuals and institutions, including doctors, midwives, nurses, pharmacies, drug stores, commercial hospitals and clinics, faith-based organisations, and non-governmental organisations. The private sector was used by the poor to a much lesser degree than by the rich but remained an important source of care for all socio-economic groups. Governments need to be aware of the importance of this sector for family planning and maternal/newborn healthcare, and to begin to understand it. A start may be to include private-sector statistics in countries' routine health management information systems.

A better comparative understanding of health policy, financing and systems, and of the economic and cultural context in countries and regions may elucidate reasons behind the different use patterns seen. For example, we need to understand why the public sector failed to serve the poor equitably for any of the examined healthcare services in sub-Saharan Africa. This may stem from the high absolute levels of poverty, so that the poorest are unable to afford the direct and indirect costs of access even to public facilities, and to a less developed middle-class that could afford private care and thus absent themselves from the public sector.

In public health terms, the presence of unmet need makes it clear that the market is not sufficient and highlights the importance of a research agenda to identify effective, cost-effective and equitable interventions to improve coverage, quality and equity of care in both sectors, including investment in research to understand how the private sector may be encouraged to provide some of these services effectively. Our data do not elucidate how coverage, quality or equity should be improved, and evidence in this area remains highly inadequate, but such interventions may include those that subsidise and train the private sector, those that intensify their regulation through legislation or voluntary accreditation and those that involve competing with the private sector by providing public services that are more affordable and of higher quality. Such efforts will be critical to achieving the sustainable development goals and universal health coverage.

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Supporting Information

Additional Supporting Information may be found in the online version of this article:

Appendix S1. Countries included in analyses of family planning, antenatal (ANC) and delivery-care services by survey year, characteristics of women sampled and whether ANC data were collected.

Appendix S2. Handling of missing data and of data with an unclassifiable sector.

Appendix S3. Proportions of women using private-sector services among women in need (bars) and upper uncertainty interval when unclassifiable appropriate care is considered to be provided by the private sector, by region and service.

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