

# Bypassing primary care clinics for childbirth: a cross-sectional study in the Pwani region, United Republic of Tanzania

Margaret E Kruk,<sup>a</sup> Sabrina Hermosilla,<sup>a</sup> Elysia Larson<sup>a</sup> & Godfrey M Mbaruku<sup>b</sup>

**Objective** To measure the extent, determinants and results of bypassing local primary care clinics for childbirth among women in rural parts of the United Republic of Tanzania.

**Methods** Women were selected in 2012 to complete a structured interview from a full census of all 30 076 households in clinic catchment areas in Pwani region. Eligibility was limited to those who had delivered between 6 weeks and 1 year before the interview, were at least 15 years old and lived within the catchment areas. Demographic and delivery care information and opinions on the quality of obstetric care were collected through interviews. Clinic characteristics were collected from staff via questionnaires. Determinants of bypassing (i.e. delivery of the youngest child at a health centre or hospital without provider referral) were analysed using multivariate logistic regression. Bypasser and non-bypasser birth experiences were compared in bivariate analyses.

**Findings** Of 3019 eligible women interviewed (93% response rate), 71.0% (2144) delivered in a health facility; 41.8% (794) were bypassers. Bypassing likelihood increased with primiparity (odds ratio, OR: 2.5; 95% confidence interval, CI: 1.9–3.3) and perceived poor quality at clinics (OR: 1.3; 95% CI: 1.0–1.7) and decreased if clinics recently underwent renovations (OR: 0.39; 95% CI: 0.18–0.84) and/or performed  $\geq 4$  obstetric signal functions (OR: 0.19; 95% CI: 0.08–0.41). Bypassers reported better quality of care on six of seven quality of care measures.

**Conclusion** Many pregnant women, especially first-time mothers, choose to bypass local primary care clinics for childbirth. Perceived poor quality of care at clinics was an important reason for bypassing. Primary care is failing to meet the obstetric needs of many women in this rural, low-income setting.

Abstracts in [عربي](#), [中文](#), [Français](#), [Русский](#) and [Español](#) at the end of each article.

## Introduction

Although maternal mortality is declining globally, it remains persistently high in sub-Saharan Africa, with 56% of the 287 000 maternal deaths worldwide in 2010 occurring in this area.<sup>1</sup> Reducing maternal mortality requires that women deliver with a skilled health-care professional who can detect and manage or refer obstetric complications that can arise without warning.<sup>2,3</sup> However, only half of all deliveries in sub-Saharan Africa are attended by health professionals. This is a central obstacle to reaching Millennium Development Goal 5, which calls for reducing maternal mortality by 75% between 1990 and 2015.<sup>4,5</sup> To increase coverage, countries in Africa and other low-income areas have focused on expanding the primary care system, typically through outpatient clinics staffed with nurses and midwives who can provide basic obstetric care.<sup>6,7</sup> These clinics represent the base of a service pyramid in which most women deliver at first-level clinics and women with high-risk pregnancies or those who develop complications are referred to hospitals. This service delivery model is supported by global policy guidance.<sup>8–10</sup>

The United Republic of Tanzania is the largest country in eastern Africa. Its population is 34.4 million and life expectancy is 51 years.<sup>11</sup> The country has a maternal mortality ratio of 460 deaths per 100 000 live births, similar to the sub-Saharan African average, and a fertility rate of 5.4 children per woman.<sup>11</sup> Ninety-six per cent of women attend at least one antenatal care visit but just over half deliver in a health facility, with substantial regional variation.<sup>11</sup> Since independence, the United Republic of Tanzania has built up an extensive primary care system, with most people living

5 to 10 km from a clinic.<sup>12</sup> Primary care clinics (referred to locally as “dispensaries”) are outpatient facilities consisting of several rooms and are staffed by nurses and clinical officers who provide basic preventive and curative services, including delivery care. National policy states that primary care clinics should provide basic emergency care for delivery complications.<sup>13</sup> However, primary care clinics tend to have poor infrastructure, to lack equipment and to be understaffed, particularly in rural areas.<sup>14</sup>

In this study, we explored women’s revealed preference for the primary-care-focused model of obstetric care. Specifically, we assessed the extent to which women in rural areas with good access to primary care clinics that offered obstetric services choose to deliver in health centres or hospitals and examined the individual and health system determinants of bypassing. We further explored the costs and quality of care received by women who bypassed. We then discuss the implications of our findings for health system organization.

## Methods

### Study setting and participants

This survey was based on baseline data collected for a cluster-randomized study that tested models for improving the quality of maternal health care in four districts of Pwani region in the United Republic of Tanzania: Bagamoyo, Kisarawe, Kibaha Rural and Mkuranga (ISRCTN 17107760). Pwani region is in the eastern part of the United Republic of Tanzania, north and east of the largest city, Dar es Salaam. The region is primarily rural and most of the population is employed in agriculture or unskilled manual labour.

<sup>a</sup> 600 West 168th Street, Room 606, Mailman School of Public Health, Columbia University, New York, NY 10032, United States of America.

<sup>b</sup> Ifakara Health Institute, Dar es Salaam, United Republic of Tanzania.

Correspondence to Margaret E Kruk (e-mail: mkruk@columbia.edu).

(Submitted: 20 June 2013 – Revised version received: 12 November 2013 – Accepted: 13 December 2013 – Published online: 5 February 2014)

The Ministry of Health assigns each village to a local primary care clinic (hereafter referred to as “clinics”). Clinics are open from 7:30 to 15:30, with providers available for emergency after-hours care, including delivery. Staff are trained and expected to perform basic emergency obstetric care and to refer patients with emergency conditions to hospital.<sup>15</sup> In addition, each administrative division has health centres with in-patient services that serve from 6000 to 10 000 people and are staffed by nurses and assistant medical officers. Each district has at least one district hospital staffed by a few physicians and with an operating theatre.

Study facilities were 24 government-managed clinics with the highest volumes of deliveries between January and June 2011 in their districts. The clinics had a mean of four health-care workers, at least one of whom was a medically trained staff member (e.g. clinical officer or nurse midwife).

Women were selected to complete a structured interview from a full census of all households in the study clinic catchment areas (total, 30 076 households). Eligibility was limited to those who had delivered between 6 weeks and 1 year before the interview, were at least 15 years of age and lived within the catchment area of a study facility. Eligible women were informed of the purpose of the study and their right to refuse participation. Interviews were performed after receipt of written consent from the participant or, in the case of minors, upon receipt of assent from the participant and consent from their guardian.

The study was approved by the ethics review boards at Columbia University, the Ifakara Health Institute in the United Republic of Tanzania and the Tanzanian National Institute for Medical Research.

### Procedures

The survey composing the structured interview and the consent forms were developed in English, translated to Swahili, back-translated to English and pre-tested to ensure accuracy. Questions covered demographic and household characteristics, child and maternal health and health-care characteristics, health system use and satisfaction and health-care preferences. The survey lasted 45 to 60 minutes and was conducted in Swahili by six teams of local

interviewers using hand-held tablet computers with Pendragon Forms VI software (Pendragon Software Corporation, Chicago, United States of America). All interviewers underwent 11 days of training in research ethics, data collection methods and the survey instrument. Supervisors observed one interview per day and conducted partial re-interviews for 3% of interviews. The population-based survey of women, conducted as part of the baseline assessment for the cluster-randomized study, was conducted between 13 February and 28 April 2012.

Assessment of the 24 clinics was conducted from 5 December 2011 to 15 May 2012. This was done using a structured questionnaire adapted from the needs assessment created by the Averting Maternal Death and Disability Program and the United Nations system that has been previously used in more than 30 countries, including the United Republic of Tanzania.<sup>8</sup> The survey included questions regarding human resources, infrastructure and the services available.

### Statistical analysis

We conducted two separate analyses. In the first we explored the determinants of bypassing clinics and in the second we used bivariate analyses to compare the transaction costs and quality of care of bypassers and non-bypassers. Bypassers were defined as women who delivered their youngest child at a health centre or hospital (secondary or tertiary level facility) and were not referred there by a health-care provider; non-bypassers were defined as women who delivered their most recent child at a clinic.

On the basis of a literature review and the utilization model of Andersen, we identified the following determinants of bypassing: demographic and household characteristics, women's experience with and perceptions of the health system and health system characteristics.<sup>16–20</sup> Variables were categorized to test hypotheses suggested by the extant literature and/or to reflect the distribution of our variables with the intent to create a parsimonious model. Demographic and household variables included age (teenage mothers and older mothers, who are potentially at higher risk, were compared to women aged 20–35 years); marital status; parity, because first-time mothers have been shown to seek higher-level facilities and

may be counselled by providers to use those facilities; literacy; and television exposure, because media exposure has been shown to promote urban behavioural norms. A relative index of wealth was constructed using principal component analysis of a set of 18 questions on ownership of household assets.<sup>21</sup> Women in the 80th wealth percentile or above were compared with those in lower wealth strata to assess whether wealth is an independent enabler of bypassing.

To assess the influence of clinics on bypassing, we also included women's experience with their local clinics and subjective perceptions of quality of care. We compared respondents who reported a quality of care rating of fair or poor with those who reported alternate ratings. Frequent users of health care were defined as women who used their clinic for any reason more than five times over the previous year (frequency of use, 80th percentile or above). Objective measures indicative of quality of care at clinics were based on the framework first articulated by Donabedian.<sup>22</sup> We selected the following structure and process measures: clinic infrastructure, performance of basic emergency obstetric care and participation in community outreach.

To build a multivariate model predicting bypassing, we conducted bivariate logistic regression analyses between bypassing and variables derived from the literature and categorized as described above. For the adjusted model, we retained variables that were significant at an  $\alpha$  level of 0.10. We then performed multivariable logistic regression to estimate adjusted associations between potential determinants and bypasser status. We included a fixed effect for the woman's district to account for between-district differences in population density, availability of a road network and availability and quality of higher-level facilities, all of which are managed by the district. Standard errors were adjusted using robust variance estimation to account for dependence of women living in the same clinic catchment area.

To compare transaction costs and delivery experience of women who bypassed versus those who did not, we asked women about the services they received, their perception of quality, their satisfaction with the services received, payment and the distance they travelled. Questions regarding each subject's perception of the quality of

care were asked using a five-point Likert scale ranging from “excellent” to “poor”. The subjects’ satisfaction with the care received was determined using a four-point Likert scale ranging from “very satisfied” to “very dissatisfied”. Their responses were then dichotomized into “excellent or very good” versus “good, fair or poor” for questions regarding quality and into “very satisfied” versus “somewhat satisfied, somewhat dissatisfied or very dissatisfied” for questions regarding satisfaction.

To determine the cost of each subject’s most recent delivery, we asked about specific costs for relevant goods and services. These costs were converted to United States dollars using the average exchange rate for the year before data collection.<sup>23</sup> We calculated a measure of distance to the delivery facility by using average speeds of travel (5 km/h by foot, 10 km/h by bicycle, 25 km/h by motorcycle and 50 km/h by car/bus) for the subject’s stated transportation method. We then conducted bivariate logistic regression to assess the association between bypasser status and variables related to women’s delivery experience.

Data were imported into Stata, version 12 (StataCorp LP, College Station, USA), for analysis and variables were examined for missing values and outliers. Univariate statistics were calculated for individual and clinic-level characteristics.

## Results

We interviewed 3019 of 3238 eligible women (93%). Non-response was predominantly attributable to non-availability of the respondent after three attempts to locate her (204/3238 [6%]) and rarely because of refusal (15 [ $< 1\%$ ]). Of the interviewed women, 71.0% (2144) delivered their most recent child in a health facility; this proportion is consistent with population-representative data from Pwani region (73.1%).<sup>11</sup>

A total of 246 women who delivered in a facility (11.5%) were referred to the health centre where they delivered. This left 1898 women for inclusion in the analysis. Of these, 794 (41.8%) bypassed their clinic and 1104 (58.2%) delivered at their clinic. Among the 794 interviewees who bypassed, 73.4% delivered in government hospitals. Additional characteristics of the 1898 participants, as well as information about their lo-

Table 1. Characteristics of the study population and local health system, United Republic of Tanzania, 2012

Characteristic	Women (n = 1898)
<b>Women</b>	
Demographic	
Age (years)	
< 20	248 (13.1)
20–35	1412 (74.4)
> 35	237 (12.5)
Muslim	1528 (80.5)
Currently married or living with partner	1578 (83.1)
Primary education or higher	1231 (64.9)
Literate <sup>a</sup>	1422 (75.1)
Primary occupation as farmer or homemaker <sup>b</sup>	1481 (79.0)
Self-rated health as good <sup>c</sup>	1332 (70.2)
No. of children, mean (SD)	2.9 (1.8)
First delivery	484 (25.7)
Household assets	
Electricity	143 (7.5)
Consumes > 2 meals per day	1890 (99.6)
Listens to the radio	1657 (87.3)
Watches television	456 (24.0)
Has a mobile phone	1466 (77.3)
Health care utilization and quality rating	
At least 1 antenatal care visit	1816 (96.4)
≥ 4 antenatal care visits	1251 (66.4)
Has health insurance	116 (6.2)
> 5 visits to local clinic in past year	555 (30.7)
Perceived overall quality of care at local clinic as fair or poor	589 (33.3)
<b>Local clinics</b>	
Electricity available	316 (16.6)
Performed ≥ 3 obstetric signal functions in past 3 months <sup>d</sup>	781 (41.1)
Upgrade or renovation within past year	384 (20.2)
Conducts community outreach	1611 (84.9)

SD, standard deviation.

<sup>a</sup> Has completed primary school or was able to read all or part of a sentence in Swahili.

<sup>b</sup> Includes homemakers, farmers and house cleaners.

<sup>c</sup> Based on a “no problem” rating on a scale of all 5 items (mobility, self-care, usual activities, pain or discomfort, and anxiety or depression) in the EQ-5D instrument (EuroQol Group, Rotterdam, Netherlands).

<sup>d</sup> Based on a maximum of 7, specified as follows: parenteral antibiotics, parenteral oxytocics, parenteral anticonvulsants, manual removal of placenta, removal of retained products, assisted vaginal delivery and newborn resuscitation with bag and mask.

Note: Data are no. (%) of subjects, unless otherwise indicated. For some rows, denominators differ from 1898 owing to missing data.

cal health systems, are summarized in Table 1.

Among study participants, 1667 (87.8%) had complete information for all the variables of interest for the final regression model. Because the findings resulting from imputed analysis did not significantly differ from those resulting from non-imputed analysis, results of non-imputed analysis are presented. In the final adjusted model, bypassers were more likely than non-bypassers to be delivering their first child (odds ratio, OR: 2.53; 95% confidence interval, CI:

1.93–3.30;  $P < 0.001$ ), to have used their clinic for any reason more than five times within the past year (OR: 1.23; 95% CI: 1.00–1.50;  $P = 0.045$ ) and to have rated the quality of care at their clinic as poor (OR: 1.29; 95% CI: 1.00–1.66;  $P = 0.049$ ) (Table 2). Bypassers were less likely than non-bypassers to be living in the catchment area of a clinic that had received an upgrade or renovation of some type within the past year (OR: 0.39; 95% CI: 0.18–0.84;  $P = 0.016$ ) or had performed four or more signal functions (the most common of which was administration

Table 2. **Multivariable associations between bypasser status and characteristics of subjects and local primary care clinics, United Republic of Tanzania, 2012**

Characteristic	aOR (95% CI)	P
<b>Women</b>		
Age (years)		
20–35	1.0	
< 20	0.83 (0.58–1.20)	0.330
> 35	1.17 (0.89–1.54)	0.252
First delivery	2.53 (1.93–3.30)	< 0.001
Literate <sup>a</sup>	1.14 (0.85–1.54)	0.387
80th percentile of wealth or above	1.44 (1.02–2.03)	0.036
Watches television	1.19 (0.92–1.54)	0.177
> 5 visits to local health clinic in past year	1.23 (1.00–1.50)	0.045
Perceived overall quality of care at local clinic as fair or poor	1.29 (1.00–1.66)	0.049
<b>Local clinics<sup>b</sup></b>		
Electricity available	0.60 (0.27–1.35)	0.217
Upgraded or renovated in past year	0.39 (0.18–0.84)	0.016
Conducts community outreach	0.75 (0.36–1.56)	0.439
Obstetric signal functions performed, no. <sup>c</sup>		
0–1	1.0	
2	0.49 (0.23–1.04)	0.065
3	0.37 (0.14–0.99)	0.047
≥ 4	0.19 (0.08–0.41)	< 0.001

aOR, adjusted odds ratio; CI, confidence interval.

<sup>a</sup> Has completed primary school or was able to read part of a sentence in Swahili.

<sup>b</sup> The primary health facility for which the subject's house falls in the official catchment area.

<sup>c</sup> Based on a maximum of 7, specified as follows: parenteral antibiotics, parenteral oxytocics, parenteral anticonvulsants, manual removal of placenta, removal of retained products, assisted vaginal delivery and newborn resuscitation with bag and mask.

Note: A total of 1667 (87.8%) of 1898 women who delivered at a facility had complete information for all variables of interest. The model also includes a fixed effect for district, not shown here, to account for differences in health system and infrastructural characteristics at this administrative level. See Methods for definitions of "bypasser" and "non-bypasser".

of parenteral oxytocics) for obstetric and neonatal care (OR: 0.19; 95% CI: 0.08–0.41;  $P < 0.001$ ).

More bypassers than non-bypassers reported receiving a blood transfusion ( $P = 0.049$ ) and an examination before their own discharge ( $P < 0.001$ ) and their neonates' ( $P = 0.007$ ; Table 3). Although they travelled significantly longer and paid significantly more for delivery, bypassers were more likely than non-bypassers to report being very satisfied with the overall delivery experience ( $P < 0.001$ ). Bypassers' ratings of quality of care were significantly higher than those reported by non-bypassers in six of seven quality measures.

## Discussion

We found that 41.8% of women who delivered children in a health-care facility in rural parts of the United Republic of Tanzania chose to deliver in a hospital or health centre rather than a local primary care clinic. This is striking because all

women lived near a functioning clinic with delivery services and the sample excluded women who were referred to hospital by health providers.

Bypassing involved substantial logistical challenges and higher costs, largely driven by expenses related to transportation. Nearly 16% of bypassers reported having to borrow money or sell household assets to finance delivery, a measure of financial hardship that can lead to impoverishment.<sup>24</sup> These data underline that access to higher-level facilities is inequitable, with the wealthiest women more likely to obtain secondary services, and that despite the United Republic of Tanzania's policy of free delivery, out-of-pocket costs for transport lead to financial hardship for families seeking hospital care.

Among women delivering their first child, the odds of bypassing were more than twice the odds of not bypassing. This may be because women and/or their antenatal care providers consider first deliveries risky and seek out advanced

obstetric care for these pregnancies. Other evidence suggests that in the United Republic of Tanzania, first deliveries are associated with higher use of hospitals and, in China, with higher rates of maternal request for Caesarean delivery.<sup>17,25</sup>

A total of 66% of subjects made four or more antenatal care visits and 31% had visited their clinic more than five times in the previous year for reasons of any type, but this did not encourage subjects to return to their clinic for delivery. This decision was not mediated by poor self-reported health and thus may have been prompted by having more information about the deficiencies of the clinic. Women's reported rating of poor quality at their clinic further increased bypassing. Other studies have found that quality of care in hospitals is better than in lower-level facilities<sup>14,26</sup> and that the infrastructure and equipment at primary care clinics in the United Republic of Tanzania and other countries in the region is inadequate.<sup>27,28</sup> Dissatisfaction with quality of care at local facilities has been shown to motivate bypassing in other studies but the sole study that examined bypassing for delivery did not include objective measures of clinic quality.<sup>17–19</sup>

In terms of the quality of their health care experience, bypassers were more likely than non-bypassers to be examined before discharge and they rated the quality of care significantly higher than non-bypassers on six of seven measures. Overall, women who delivered in hospitals or health centres were nearly twice as likely to be very satisfied with their birth experience as women who delivered in primary care. Other studies have similarly documented better quality of care in hospitals versus lower-level facilities.<sup>15,29</sup>

A strength of this study was the availability of objective data on the quality of the structure and process of care in the primary care facilities. We found that recent facility upgrades in a woman's catchment clinic reduced her probability of bypassing and that the number of basic emergency obstetric services performed in the clinic in the previous three months was a strong and consistent predictor of women's behaviour. These results support the notion that Tanzanian women have good information about the obstetric care available in clinics and act on this information.<sup>18</sup>



Table 3. **Bivariate analysis comparing travel, payment, and quality of care among bypassers and non-bypassers, United Republic of Tanzania, 2012**

Characteristic <sup>a</sup>	Bypassers <sup>b</sup>		Non-bypassers <sup>c</sup>		cOR (95% CI)	P
<b>Travel to facility</b>						
Walked to facility	47	(5.9)	330	(30.1)	1.00	
Travelled by bicycle to facility	4	(0.5)	70	(6.4)	0.40 (0.14–1.15)	0.089
Travelled by motorcycle to facility	228	(28.8)	579	(52.7)	2.76 (1.96–3.89)	<0.001
Travelled by car or bus to facility	515	(64.9)	119	(10.8)	30.38 (21.10–43.77)	<0.001
Distance travelled (km), mean (SD)	36.8	(53.3)	10.6	(16.9)	1.04 (1.03–1.05)	<0.001
<b>Payment for delivery</b>						
Provider fees (US\$), mean (SD)	2.2	(10.7)	2.4	(14.2)	1.00 (0.99–1.01)	0.731
Drugs, supplies, tests (US\$), mean (SD)	5.0	(6.6)	3.6	(4.0)	1.06 (1.04–1.08)	<0.001
Transportation (US\$), mean (SD)	6.0	(8.1)	2.0	(4.5)	1.20 (1.16–1.23)	<0.001
Total costs (US\$), mean (SD) <sup>d</sup>	17.5	(28.4)	8.8	(15.9)	1.07 (1.00–1.08)	<0.001
Borrowed or sold asset to pay for health care	122	(15.5)	129	(11.9)	1.36 (1.04–1.78)	0.023
<b>Services received during and after delivery</b>						
Uterotonic	603	(76.1)	856	(78.3)	0.88 (0.71–1.10)	0.264
IV antibiotic or other drug	177	(22.3)	236	(21.6)	1.05 (0.84–1.30)	0.695
Blood transfusion	21	(2.7)	15	(1.4)	1.96 (1.00–3.82)	0.049
Baby examined before discharge	584	(74.8)	748	(60.0)	1.33 (1.08–1.64)	0.007
Mother examined before discharge	345	(43.5)	357	(32.7)	1.59 (1.31–1.92)	<0.001
<b>Very good/excellent rating of elements of delivery care</b>						
Respectful communication from health worker	381	(48.0)	443	(40.4)	1.36 (1.13–1.64)	0.001
Cleanliness of the delivery room	285	(36.0)	311	(28.5)	1.41 (1.16–1.72)	0.001
Privacy of the delivery room	317	(40.2)	426	(38.9)	1.05 (0.87–1.27)	0.577
Clarity of communication from health worker	310	(39.1)	370	(33.8)	1.26 (1.04–1.52)	0.017
Knowledge of the health worker	352	(44.6)	404	(36.9)	1.37 (1.14–1.65)	0.001
Availability of drugs and modern equipment	276	(35.3)	248	(22.9)	1.84 (1.50–2.25)	<0.001
Overall quality of care	468	(58.9)	511	(46.7)	1.64 (1.36–1.97)	<0.001
<b>Very satisfied with the delivery experience</b>						
	513	(64.6)	543	(49.5)	1.86 (1.54–2.24)	<0.001

CI, confidence interval; cOR, crude odds ratio; IV, intravenous; SD, standard deviation; US\$, United States dollar.

<sup>a</sup> For all characteristics, data denote the ratio of the odds of the characteristic being reported by a bypasser ( $n=794$ ) to the odds of the characteristic being reported by a non-bypasser ( $n=1104$ ).

<sup>b</sup> Defined as women who delivered their youngest child at a health centre or hospital (secondary or tertiary level facility) and were not referred there by a health-care provider.

<sup>c</sup> Defined as women who delivered their most recent child at a primary care clinic.

<sup>d</sup> Includes costs of transportation, provider fees, drugs, supplies, tests and tips. For context, the Tanzanian per capita gross domestic product was US\$ 474 in 2012.

Note: Data are for 1898 women. For some rows, denominators differ from 1898, owing to missing data.

The study has several potential limitations. Our analysis is based on cross-sectional data, which makes it impossible to draw causal inferences about the determinants of bypassing. However, since most predictors preceded the delivery, reverse causation is unlikely. ORs may overestimate likelihood when the outcome is relatively common, as in this analysis. The health system characteristics investigated are indicators of the capacity of the health system available to women and are not linked to the time at which the women delivered. Because our study participants were selected on the basis of good access to primary health care, our results are not generalizable to the rest of the United Republic of Tanzania, where bypassing is even higher. Because data were obtained via

survey, recall bias is possible, although the potential for such bias is low because women delivered within one year of the survey. Finally, our data did not permit us to assess the availability of hospitals/health centres and the availability of transportation in bypassing decisions.

Our findings have important implications for health system organization. Although primary care serves many important functions, it may not be the optimal platform for providing high-quality delivery care. Policy-makers should consider gradually shifting the provision of obstetric care to health centres and hospitals, with primary care clinics playing a back-up role. This would have several advantages over the current model. First, it could improve health outcomes for mothers

and neonates by concentrating obstetric care in high-volume settings with more competent providers and better equipment. Second, it would better match the expectations of pregnant women and thus strengthen the responsiveness of the health system to users. Finally, it could improve efficiency in the health system and free the funds invested, in maintaining the infrastructure and providers needed to attend (infrequent) deliveries, to be spent on other priorities. Such reorganization would require careful consideration of health system funding, transportation and referral. Health centres and hospitals would probably need to expand their maternity wards and vehicle fleets and improve transport protocols and communication. To promote equitable access to

higher-level care, poor women will need to be given transport subsidies, vouchers and other support. Useful models for this exist in other countries.<sup>29-32</sup>

Obstetric care needs to be of high quality and should be used universally to reduce maternal mortality. The preferences and experiences of women should thus inform health system design. Looking into the future, as Tanzanian families become wealthier, smaller and more experienced with the health-care system, bypassing is likely to rise. Shifting the focus of delivery care to health centres and hospitals could both save more lives

and inspire greater confidence in the health system while making best use of scarce resources. ■

#### Acknowledgements

We thank Angela Kimweri and Festo Mazungani and our team of interviewers, for their research assistance; Drs. Beatrice Byalugaba and Neema Rusibamayila and the Bagamoyo, Kisarawe, Kibaha Rural and Mkuranga district health authorities, for their continual support of the project; and the participating women, for generously sharing their health system experiences.

**Funding:** This study was funded by the National Institute of Allergy and Infectious Diseases (grant 1R01 AI093182). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The sponsor of the study had no role in study design; data gathering, analysis and interpretation; or writing of the report. The corresponding author had full access to all the data in the study and had final responsibility for the decision to submit for publication.

**Competing interests:** None declared.

## ملخص

### اجتناب عيادات الرعاية الأولية للولادة : دراسة متعددة القطاعات في منطقة بواني، جمهورية تنزانيا المتحدة

النتائج قامت نسبة 71.0% (2144 سيدة) من إجمالي 3019 سيدة مؤهلة تم إجراء المقابلة معهن (معدل الاستجابة 93%)، بالولادة في مرفق صحي واجتنب ذلك نسبة 41.8% (794 امرأة). وازدادت احتمالية الاجتناب مع البكرية (نسبة الاحتمال: 2.5؛ فاصل الثقة 95%: من 1.9 إلى 3.3) وضعف الجودة الملحوظ في العيادات (نسبة الاحتمال: 1.3؛ فاصل الثقة 95%: من 1.0 إلى 1.7) وانخفضت في حالة العيادات التي تم تجديدها مؤخراً (نسبة الاحتمال: 0.39؛ فاصل الثقة 95%: من 0.18 إلى 0.84) و/أو أجرت ما يزيد عن أو يساوي 4 وظائف إشارات توليدية (نسبة الاحتمال: 0.19؛ فاصل الثقة 95%: من 0.08 إلى 0.41). وأبلغت النساء اللاتي اجتنبن هذه العيادات عن تحسن جودة الرعاية في ست من سبع تدابير خاصة بجودة الرعاية. الاستنتاج يختار العديد من النساء الحوامل، ولا سيما الأمهات لأول مرة اجتناب عيادات الرعاية الأولية المحلية في ولادتهن. وكان ضعف جودة الرعاية الملحوظ في العيادات سبباً مهماً في اجتناب هذه العيادات. وتعجز الرعاية الأولية عن تلبية احتياجات الولادة للعديد من النساء في هذه المنطقة الريفية منخفضة الدخل.

الغرض قياس المدى الخاص بمحددات ونتائج اجتناب عيادات الرعاية الأولية المحلية للولادة بين النساء في المناطق الريفية في جمهورية تنزانيا المتحدة. الطريقة تم اختيار مجموعة من النساء في عام 2012 لإجراء مقابلة منظمة من بين تعداد كامل لجميع الأسر المعيشية البالغ عددها 30076 أسرة في مناطق مستجمعات العيادات في منطقة بواني. وكانت الأهلية قاصرة على الإناث اللاتي ولدن قبل المقابلة بفترة تتراوح من 6 أسابيع إلى سنة واحدة وكان عمرهن 15 عاماً على الأقل وعشن داخل مناطق المستجمعات. وتم جمع المعلومات الديموغرافية وتلك الخاصة برعاية الولادة والآراء بشأن جودة الرعاية التوليدية من خلال المقابلات. وتم جمع خصائص العيادات من الموظفين عن طريق الاستبيانات. وتم تحليل محددات الاجتناب (أي ولادة الطفل الأصغر في مركز صحي أو مستشفى دون إحالة من مقدمي الخدمات) باستخدام الارتداد اللوجستي متعدد المتغيرات. وتم مقارنة خبرات الولادة بين الإناث اللاتي اجتنبن عيادات الرعاية الأولية للولادة واللاتي لم يجتنبنها في تحليلات ثنائية المتغيرات.

## 摘要

### 农村地区分娩绕过初级护理诊所：坦桑尼亚联合共和国滨海区横断面研究

**目的** 估测坦桑尼亚联合共和国农村地区妇女分娩绕过本地初级保健诊所的程度、决定因素和结果。

**方法** 在 2012 年从滨海区诊所病人来源区所有 30076 户家庭全面人口普查中选择妇女完成结构化访谈。仅在访谈之前 6 周至 1 年之间有过生育、至少 15 岁并居住在来源区的女性才符合纳入资格。通过访谈收集人口统计学和分娩护理信息以及对产科护理质量的看法。通过问卷调查收集诊所特征。使用多元逻辑回归分析绕过诊所（即不经过医务人员转诊而在卫生院或医院生育最小的孩子）的决定因素。在二变量分析中比较绕过者和非绕过者的生育体验。

**结果** 在受访谈的 3019 名符合调查资格的妇女（93%

响应率）中，71.0% (2144) 在医疗机构分娩；41.8% (794) 为绕过者。初产（优势比，OR：2.5；95% 置信区间，CI：1.9 - 3.3）和感觉诊所服务质量差（OR：1.3；95% CI：1.0 - 1.7）则绕过可能性增加；如果诊所最近经过翻新（OR：0.39；95% CI：0.18 - 0.84）和/或执行了四种或以上的产科信号功能（OR：0.19；95% CI：0.08 - 0.41）则绕过可能性降低。在七个护理质量的量度中绕过者报告有六个的护理质量更好。

**结论** 很多孕妇（尤其是第一次生产的母亲）选择绕过本地初级医疗诊所进行分娩。感觉初级医疗诊所护理质量差是绕过的主要原因。初级护理未能满足这一农村低收入区域很多女性的产科需求。

## Résumé

### Contournement des cliniques de soins primaires pour l'accouchement: une étude transversale dans la région de Pwani, en République-Unie de Tanzanie

**Objectif** Mesurer l'ampleur, les déterminants et les résultats du contournement des cliniques locales de soins primaires pour l'accouchement des femmes des régions rurales de la République-Unie de Tanzanie.

**Méthodes** En 2012, des femmes ont été sélectionnées pour une enquête structurée à partir d'un recensement complet des 30 076 ménages dans les zones d'influence clinique de la région de Pwani. Seules ont été admises les femmes qui avaient accouché 6 semaines à 1 an avant l'enquête, avaient au moins 15 ans et vivaient dans les zones d'influence. Des informations démographiques et sur les soins fournis lors de l'accouchement, ainsi que des avis sur la qualité des soins obstétricaux ont été recueillis dans le cadre d'entrevues. Les caractéristiques cliniques ont été recueillies par le personnel au moyen de questionnaires. Les déterminants du contournement (c'est-à-dire l'accouchement du plus jeune enfant dans un établissement de soins ou à l'hôpital sans recommandation du prestataire de soins) ont été analysés par régression logistique multivariée. Les expériences d'accouchement avec ou sans contournement ont été comparées dans des analyses à deux variables.

**Résultats** Sur 3019 femmes admissibles interrogées (taux de réponse de 93%), 71,0% (2144) ont accouché dans un établissement de santé; 41,8% (794) avaient contourné les cliniques. La probabilité de contournement augmentait avec la primiparité (rapport des cotes, CR: 2,5; intervalle de confiance à 95%, IC: 1,9 à 3,3) et la perception de la médiocrité des soins en clinique (CR: 1,3; IC à 95%: 1 à 1,7) et elle diminuait si les cliniques avaient récemment effectué des travaux de rénovation (CR: 0,39; IC à 95%: 0,18 à 0,84) et/ou effectuaient 4 fonctions de signal obstétrique ou plus (CR: 0,19; IC à 95%: 0,08 à 0,41). Une meilleure qualité de 6 des 7 mesures de qualité des soins a été signalée par les femmes contournant les cliniques.

**Conclusion** De nombreuses femmes enceintes, surtout en cas de première grossesse, choisissent de contourner les cliniques de soins primaires locales pour leur accouchement. La perception de la médiocrité des soins fournis dans les cliniques constitue une importante raison de contournement. Les soins primaires ne répondent pas aux besoins obstétricaux de nombreuses femmes dans les contextes ruraux à bas revenu.

## Резюме

### Отказ рожениц от услуг клиник первичной помощи: одновременное поперечное углубленное исследование статистики в округе Пвани, Объединенная Республика Танзания

**Цель** Количественно оценить степень, детерминанты и результаты отказа рожениц от услуг местных клиник первичной помощи в сельских районах Объединенной Республики Танзания.

**Методы** В 2012 году было выполнено выборочное исследование среди женщин с проведением структурированного интервью на основе полной переписи всех 30 076 домашних хозяйств в районах, приписанных к клиникам первичной медико-санитарной помощи в округе Пвани. В исследовании принимали участие женщины, родившие в период от 6 недель до 1 года до проведения опроса, достигшие 15-летнего возраста и проживающие в районах, приписанных к клиникам. В ходе интервью были собраны данные о демографическом составе рожениц, родильных учреждениях и отзывы женщин о качестве акушерской помощи. Характеристики клиник были получены путем анкетирования персонала. Факторы, определяющие отказ от услуг (т.е. рождение младшего ребенка в медицинском центре или больнице без направления соответствующей клиники), были проанализированы с использованием многомерной логистической регрессии. Опыт рожениц, поступивших по направлению первичных клиник и без такового, сравнивался по методике двумерного анализа.

**Результаты** Из 3019 женщин, давших интервью (процент участия 93%), 71,0% (2144) рожали в медицинском учреждении; из них 41,8% (794) поступили не по направлению. Вероятность отказа от услуг первичных клиник возрастала в случаях рождения первого ребенка (отношение рисков, ОР: 2,5; 95% доверительный интервал, ДИ: 1,9–3,3), а также вследствие негативного восприятия качества обслуживания в этих клиниках (ОР: 1,3; 95% ДИ: 1,0–1,7) и уменьшалась, если в клинике недавно был проведен ремонт (ОР: 0,39; 95% ДИ: 0,18–0,84) и/или клиника выполняла не менее 4 акушерских сигнальных функций (ОР: 0,19; 95% ДИ: 0,08–0,41). Роженицы, не имевшие направления, сообщали о лучшем качестве медицинской помощи по шести из семи параметров качества медицинской помощи.

**Вывод** Многие беременные женщины, особенно рожавшие в первый раз, отказываются от услуг местных клиник первичной помощи. Распространенное мнение о низком качестве медицинской помощи в этих клиниках являлось важной причиной такого выбора. Местные клиники первичной медико-санитарной помощи оказались не в состоянии удовлетворить акушерские потребности многих женщин в этом сельском округе с низкими доходами населения.

## Resumen

### Prescindir de las clínicas de atención primaria para el parto: un estudio transversal en la región de Pwani, Tanzania

**Objetivo** Medir la extensión, los factores determinantes y los resultados de prescindir de clínicas locales de atención primaria para el parto entre las mujeres de zonas rurales de Tanzania.

**Métodos** En 2012 se seleccionaron las mujeres para completar una entrevista estructurada de un censo completo de todos los 30 076 hogares de las áreas de captación clínica de la región de Pwani. La elegibilidad se limitaba a las mujeres que habían dado a luz entre 6

semanas y 1 año antes de la entrevista, tenían al menos 15 años y vivían dentro de las áreas de captación. Se recogieron las opiniones sobre la calidad de la atención obstétrica e información demográfica y sobre la atención en el parto mediante entrevistas, así como las características de la clínica mediante cuestionarios al personal. Se analizaron los factores determinantes de prescindir de las clínicas (es decir, dar a luz al hijo menor en un centro sanitario o un hospital sin derivación por parte

del prestador de salud) mediante regresión logística multivariada. Se compararon las experiencias de nacimiento entre quienes prescindieron y no prescindieron de las clínicas en análisis bivariados.

**Resultados** De las 3019 mujeres elegibles que se entrevistaron (tasa de respuesta del 93 %), el 71,0 % (2144) dio a luz en un centro sanitario y el 41,8 % (794) prescindió de las clínicas. La probabilidad de prescindir de las clínicas aumenta con la primiparidad (proporción de probabilidades, OR: 2,5; intervalo de confianza del 95 %, IC: 1,9–3,3) y la percepción de calidad deficiente en las clínicas (OR: 1,3; IC del 95 %: 1,0–1,7). Por otro lado, disminuía si las clínicas se habían renovado recientemente (OR:

0,39; IC del 95 %: 0,18–0,84) y/o realizaban  $\geq 4$  funciones de señalización obstétrica (OR: 0,19; IC del 95 %: 0,08–0,41). Quienes prescindieron de las clínicas comunicaron una mejor calidad de la atención en seis de siete de las medidas de calidad de la atención.

**Conclusión** Muchas mujeres embarazadas, sobre todo las madres primerizas, eligen prescindir de las clínicas de atención primaria para dar a luz. La percepción de calidad deficiente de la atención en las clínicas fue un motivo importante para prescindir de las mismas. La atención primaria no logra satisfacer las necesidades obstétricas de muchas mujeres de este entorno rural de bajos ingresos.

## References

1. *Trends in maternal mortality: 1990 to 2010: WHO, UNICEF and The World Bank estimates*. Geneva: World Health Organization; 2012. Available from: [http://whqlibdoc.who.int/publications/2012/9789241503631\\_eng.pdf](http://whqlibdoc.who.int/publications/2012/9789241503631_eng.pdf) [accessed 16 December 2013].
2. Ronsmans C, Graham WJ; Lancet Maternal Survival Series steering group. Maternal mortality: who, when, where, and why. *Lancet* 2006;368:1189–200. doi: [http://dx.doi.org/10.1016/S0140-6736\(06\)69380-X](http://dx.doi.org/10.1016/S0140-6736(06)69380-X) PMID:17011946
3. *World health report 2005: make every mother and child count*. Geneva: World Health Organization; 2005. Available from: <http://www.who.int/whr/2005/en/> [accessed 10 January 2013].
4. Bryce J, Daelmans B, Dwivedi A, Fauveau V, Lawn JE, Mason E et al.; Countdown Coverage Writing Group; Countdown to 2015 Core Group. Countdown to 2015 for maternal, newborn, and child survival: the 2008 report on tracking coverage of interventions. *Lancet* 2008;371:1247–58. doi: [http://dx.doi.org/10.1016/S0140-6736\(08\)60559-0](http://dx.doi.org/10.1016/S0140-6736(08)60559-0) PMID:18406859
5. Bhutta ZA, Chopra M, Axelson H, Berman P, Boerma T, Bryce J et al. Countdown to 2015 decade report (2000–10): taking stock of maternal, newborn, and child survival. *Lancet* 2010;375:2032–44. doi: [http://dx.doi.org/10.1016/S0140-6736\(10\)60678-2](http://dx.doi.org/10.1016/S0140-6736(10)60678-2) PMID:20569843
6. Campbell O, Graham WJ; Lancet Maternal Survival Series steering group. Strategies for reducing maternal mortality: getting on with what works. *Lancet* 2006;367:368. PMID:16443045
7. Brazier E, Andrzejewski C, Perkins ME, Themmen EM, Knight RJ, Bassane B. Improving poor women's access to maternity care: Findings from a primary care intervention in Burkina Faso. *Soc Sci Med* 2009;69:682–90. doi: <http://dx.doi.org/10.1016/j.socscimed.2009.06.023> PMID:19596165
8. Paxton A, Bailey P, Lobis S, Fry D. Global patterns in availability of emergency obstetric care. *Int J Gynaecol Obstet* 2006;93:300–7. doi: <http://dx.doi.org/10.1016/j.ijgo.2006.01.030> PMID:16682039
9. Pearson L, Shoo R. Availability and use of emergency obstetric services: Kenya, Rwanda, Southern Sudan, and Uganda. *Int J Gynaecol Obstet* 2005;88:208–15. doi: <http://dx.doi.org/10.1016/j.ijgo.2004.09.027> PMID:15694109
10. Koblinsky M, Matthews Z, Hussein J, Mavalankar D, Mridha MK, Anwar I et al.; Lancet Maternal Survival Series steering group. Going to scale with professional skilled care. *Lancet* 2006;368:1377–86. doi: [http://dx.doi.org/10.1016/S0140-6736\(06\)69382-3](http://dx.doi.org/10.1016/S0140-6736(06)69382-3) PMID:17046470
11. *Tanzania Demographic and Health Survey 2010*. Dar es Salaam & Calverton (MD): National Bureau of Statistics Tanzania & ICF Macro; 2011. Available from: <http://www.measuredhs.com/pubs/pdf/FR243/FR243%5B24June2011%5D.pdf> [accessed 16 December 2013].
12. *Tanzania Demographic and Health Survey 1996*. Dar es Salaam: Bureau of Statistics Planning Commission of Tanzania; 1997.
13. *National health policy*. Dar es Salaam: Ministry of Health of the United Republic of Tanzania; 2003.
14. Hsia RY, Mbembati NA, Macfarlane S, Kruk ME. Access to emergency and surgical care in sub-Saharan Africa: the infrastructure gap. *Health Policy Plan* 2012;27:234–44. doi: <http://dx.doi.org/10.1093/heapol/czr023> PMID:21441566
15. Lobis S, Mbaruku G, Kamwendo F, McAuliffe E, Austin J, de Pinho H. Expected to deliver: alignment of regulation, training, and actual performance of emergency obstetric care providers in Malawi and Tanzania. *Int J Gynaecol Obstet* 2011;115:322–7. doi: <http://dx.doi.org/10.1016/j.ijgo.2011.09.008> PMID:22036057
16. Yaffee AQ, Whiteside LK, Oteng RA, Carter PM, Donkor P, Rominski SD et al. Bypassing proximal health care facilities for acute care: a survey of patients in a Ghanaian Accident and Emergency Centre. *Trop Med Int Health* 2012;17:775–81. doi: <http://dx.doi.org/10.1111/j.1365-3156.2012.02984.x> PMID:22519746
17. Kruk ME, Mbaruku G, McCord CW, Moran M, Rockers PC, Galea S. Bypassing primary care facilities for childbirth: a population-based study in rural Tanzania. *Health Policy Plan* 2009;24:279–88. doi: <http://dx.doi.org/10.1093/heapol/czp011> PMID:19304785
18. Leonard KL, Mliga GR, Haile Mariam D. Bypassing health centres in Tanzania: revealed preferences for quality. *J Afr Econ* 2002;11:441–71. doi: <http://dx.doi.org/10.1093/jae/11.4.441>
19. Akin JS, Hutchinson P. Health-care facility choice and the phenomenon of bypassing. *Health Policy Plan* 1999;14:135–51. doi: <http://dx.doi.org/10.1093/heapol/14.2.135> PMID:10538717
20. Aday LA, Andersen R. A framework for the study of access to medical care. *Health Serv Res* 1974;9:208–20. PMID:4436074
21. Filmer D, Pritchett LH. Estimating wealth effects without expenditure data—or tears: an application to educational enrollments in states of India. *Demography* 2001;38:115–32. PMID:11227840
22. Donabedian A. The quality of care. How can it be assessed? *JAMA* 1988;260:1743–8. doi: <http://dx.doi.org/10.1001/jama.1988.03410120089033> PMID:3045356
23. Oanda. Historical exchange rates (USD – Tanzanian shilling) [Internet]. Singapore: Oanda; 2013. Available from: <http://www.oanda.com/currency/historical-rates/> [accessed 13 March 2013].
24. Kruk ME, Goldmann E, Galea S. Borrowing and selling to pay for health care in low- and middle-income countries. *Health Aff (Millwood)* 2009;28:1056–66. doi: <http://dx.doi.org/10.1377/hlthaff.28.4.1056> PMID:19597204
25. Zhang J, Liu Y, Meikle S, Zheng J, Sun W, Li Z. Cesarean delivery on maternal request in southeast China. *Obstet Gynecol* 2008;111:1077–82. doi: <http://dx.doi.org/10.1097/AOG.0b013e31816e349e> PMID:18448738
26. Audo MO, Ferguson A, Njoroge PK. Quality of health care and its effects in the utilisation of maternal and child health services in Kenya. *East Afr Med J* 2005;82:547–53. PMID:16463747
27. Gilson L, Magomi M, Mkangaa E. The structural quality of Tanzanian primary health facilities. *Bull World Health Organ* 1995;73:105–14. PMID:7704920
28. Hsia RY, Mbembati NA, Macfarlane S, Kruk ME. Access to emergency and surgical care in sub-Saharan Africa: the infrastructure gap. *Health Policy Plan* 2012;27:234–44. PMID:21441566
29. Lim SS, Dandona L, Hoisington JA, James SL, Hogan MC, Gakidou E. India's Janani Suraksha Yojana, a conditional cash transfer programme to increase births in health facilities: an impact evaluation. *Lancet* 2010;375:2009–23. doi: [http://dx.doi.org/10.1016/S0140-6736\(10\)60744-1](http://dx.doi.org/10.1016/S0140-6736(10)60744-1) PMID:20569841
30. Schmidt JO, Ensor T, Hossain A, Khan S. Vouchers as demand side financing instruments for health care: a review of the Bangladesh maternal voucher scheme. *Health Policy* 2010;96:98–107. doi: <http://dx.doi.org/10.1016/j.healthpol.2010.01.008> PMID:20138385
31. Ir P, Horemans D, Souk N, Van Damme W. Using targeted vouchers and health equity funds to improve access to skilled birth attendants for poor women: a case study in three rural health districts in Cambodia. *BMC Pregnancy Childbirth* 2010;10:1. doi: <http://dx.doi.org/10.1186/1471-2393-10-1> PMID:20059767
32. Barker CE, Bird CE, Pradhan A, Shakya G. Support to the Safe Motherhood Programme in Nepal: an integrated approach. *Reprod Health Matters* 2007;15:81–90. doi: [http://dx.doi.org/10.1016/S0968-8080\(07\)30331-5](http://dx.doi.org/10.1016/S0968-8080(07)30331-5) PMID:17938073