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Sociocultural Determinants of Anticipated Vaccine Acceptance for Acute Watery Diarrhea in Early Childhood in Katanga Province, Democratic Republic of Congo

Sonja Merten,* Christian Schaetti, Cele Manianga, Bruno Lapika, Raymond Hutubessy, Claire-Lise Chaignat, and Mitchell Weiss

Department of Epidemiology and Public Health, Swiss Tropical and Public Health Institute, Basel, Switzerland; Institut d'Anthropologie, Université de Kinshasa, Kinshasa, Democratic Republic of Congo; Initiative for Vaccine Research and Global Task Force on Cholera Control, World Health Organization, Geneva, Switzerland

Abstract. Rotavirus and oral cholera vaccines have the potential to reduce diarrhea-related child mortality in low-income settings and are recommended by the World Health Organization. Uptake of vaccination depends on community support, and is based on local priorities. This study investigates local perceptions of acute watery diarrhea in childhood and anticipated vaccine acceptance in two sites in the Democratic Republic of Congo. In 2010, 360 randomly selected non-affected adults were interviewed by using a semi-structured questionnaire. Witchcraft and breastfeeding were perceived as potential cause of acute watery diarrhea by 51% and 48% of respondents. Despite misperceptions, anticipated vaccine acceptance at no cost was 99%. The strongest predictor of anticipated vaccine acceptance if costs were assumed was the educational level of the respondents. Results suggest that the introduction of vaccines is a local priority and local (mis)perceptions of illness do not compromise vaccine acceptability if the vaccine is affordable.

INTRODUCTION

Vaccines protecting against causes of acute watery diarrhea in childhood, namely rotavirus or cholera infections, have the potential to mitigate the high global burden of childhood diarrhea as part of diarrheal disease control strategies and to reduce child mortality as postulated in the Millennium Development Goal 4.[1,2] However, experience with the use of vaccines has shown that social and cultural factors may compromise vaccine acceptance.[3,4] Assessing vaccine acceptability and its social and cultural determinants provides important information to make immunization program potentially more useful.[5]

Rotavirus is the most common viral infection leading to severe watery diarrhea in children; it is responsible for a large part of diarrhea-related hospitalizations and deaths.[6,7] Rotavirus accounts for approximately 37% of diarrhea-related child mortality: each year, approximately 801,000 children less than five years of age die of diarrhea.[8] India and sub-Saharan Africa, spearheaded by Nigeria, the Democratic Republic of Congo, and Ethiopia, account for most of these deaths. In sub-Saharan Africa, common diarrheagenic pathogens include *pathogenic Escherichia coli*, *Campylobacter jejuni*, *Vibrio cholerae*, *Shigella* spp., *Salmonella* spp., *Cryptosporidium parvum*, *Norovirus,* and *Giardia lamblia*. If untreated, they can lead to severe dehydration, malnutrition, and possibly death.[9–12] Most infections could be prevented at low cost by the provision of clean water, sanitary infrastructure, and health education; but to date, this strategy has not had sufficient impact on the incidence of childhood diarrhea.

The use of vaccines to prevent rotavirus infections has recently been confirmed as complementary strategy to reduce diarrhea-related child mortality: In 2009, the World Health Organization Strategic Advisory Group of Experts on immunization recommended inclusion of rotavirus vaccination in standard immunization packages in low-income countries.[13] Currently, two live-attenuated, orally administered rotavirus vaccines are licensed and available, a pentavalent bovine–human reassortant vaccine (RotaTeq; Merck and Co., Inc., Whitehouse Station, NJ) and a monovalent human rotavirus strain vaccine (Rotarix; GlaxoSmithKline, Brentford, UK), both of which have been found to be safe, efficacious and cost-effective.[14,15]

Among the other diarrheagenic organisms, two vaccines have been licensed for international use for cholera (Dukoral; Janssen Inc., Toronto, Ontario, Canada, and Shanchol; Sanofi Pasteur, Lyon, France). There is an increasing interest to introduce oral cholera vaccines as a complementary means of cholera control because current approaches have not led to the expected reduction in cholera incidence.[16,17] In 2011, the World Health organization declared cholera a global priority (WHA64.15). Cholera incidence rates have been shown to be particularly high in children who also experience more severe infection.[18] Like rotavirus, oral cholera vaccines have been proven effective, although for children more doses might be necessary.[19–21]

Vaccine acceptance by its users is vital for the effectiveness of immunization campaigns in addition to the availability of safe and efficacious vaccines and functional supply and distribution mechanisms. However, use of vaccines is not uncritically accepted. Rumors about alleged long-term consequences, such as sterility, allergies, or mental health problems, have slowed vaccination campaigns for polio and measles.[4,22–26] Most of the rumors associated with vaccines are unfounded despite some few exceptions (e.g., RotaShield; Wyeth, New York, NY, was licensed in 1998. When intussusception developed in some infants, the vaccine was withdrawn from the market shortly after its release).[27] In low-income countries, fears are also linked to suspicion that vaccines are sometimes expired and may then become dangerous for a child.[28]

Costs and accessibility problems are other important barriers to vaccination in low-income settings,[29–33] and gender inequality plays a major role in health-related decision-making.[34,35] A low maternal education also negatively influences immunization status of children.[30,33,36]

This study investigates anticipated vaccine acceptance to prevent acute diarrhea in children in two sites of Katanga Province, Democratic Republic of Congo, where diarrhea incidence is among the highest in the country and cholera is endemic.[37] The study sought to describe local illness perceptions, establish the local priority for vaccines, and clarify the role of socioeconomic

*Address correspondence to Sonja Merten, Epidemiology and Public Health, Swiss Tropical and Public Health Institute, Socinstrasse 57, Basel 4002, Switzerland. E-mail: sonja.merten@unibas.ch

and sex differentials. It also examined local illness perceptions affecting anticipated vaccine acceptance.

MATERIALS AND METHODS

Study site. The study sites are located in Katanga Province approximately 200 km east of Lubumbashi in a riverine and lakeland area with a high prevalence of childhood diarrhea and endemic cholera.[37,38] Two sites eligible for both rotavirus and cholera vaccine introduction were selected, one (Kasenga) being more urban than the other (Nkolé). Kasenga is a rural town situated on the riverside of the Luapula River, which forms the border with Zambia, and has eight quartiers with a total population of 27,000 persons, mainly ciBemba-speaking inhabitants living in an area of 10 km^2. The study was conducted in the quartier of Mwalimu, a area with a high density of diarrhea and endemic cholera, little sanitary infrastructure, and a population of 10,300 inhabitants. The second site, Nkolé, is a Bemba fishing village approximately 120 km downstream from Kasenga and said to be at the origin of the seasonal cholera outbreaks. Nkolé has approximately 6,000 inhabitants, who are mainly engaged in agriculture and fisheries. Some fishermen are seasonal migrants.

Study design. A cross-sectional cultural epidemiology study integrating quantitative and qualitative methods was conducted to assess acceptability of a vaccine against acute watery diarrhea in childhood and for adults. The interview was divided in two parts, the first addressing severe watery diarrhea in adulthood. The results from this first part of the interview have been published elsewhere.[39] In the second part, a vignette was read to the participants, which described cardinal physical symptoms as in the case of a rotavirus infection of a child (acute watery diarrhea, vomiting, fever, poor general condition). Based on this vignette a semi-structured interview by using an Explanatory Model Interview Catalog (EMIC)[40–43] enquired about illness-related experience, perceived causes, and help-seeking behavior. Additional topics related to vaccination were addressed.

Instrument. The semi-structured EMIC interview contained four questions on anticipated vaccine acceptance, which were regarded as the dependent variables in the analysis. Use of healthcare services always implies some indirect cost, which may not be considered by respondents when asked about vaccine acceptability. Therefore, assuming costs is more realistic even in contexts in which vaccines are usually provided free. In this study we made the following assumptions: no cost; $1, $5, and $10.5 (US). The instrument further included questions about individual characteristics (age, sex, marital status), socio-economic factors (education, main source of income, household income, household composition), susceptibility to diarrheal illness and illness severity, perceived symptoms, perceived causes (contaminated food, water, dirty environment, not washing hands, flies, lack of latrines, contaminated water, eating soil, God's will, witchcraft, worms, forbidden food, malaria, violation of taboo), treatment seeking (self-treatment with oral rehydration therapy, antiobiotics, drinking more liquid, herbal treatments, health facilities, traditional healers, prayers, faith healers, informal help), social impact (anxiety, loss of income, interference with social relationships, isolation from others, interference with daily life, direct costs, disruption of health services).

Sampling strategy and data collection. Three hundred sixty randomly selected adults more than 18 years of age who lived in a given place for at least six months were included. Households were identified by using the random walk method because no census data was available. The study protocol is explained more in detail in the context of a previous study investigating anticipated acceptance of oral cholera vaccines in Zanzibar.[42] During September–October 2010, data were collected by locally recruited interviewers who were fluent in the local language and had been trained for 10 days before the fieldwork. Every participant was informed about the study and gave written consent before being interviewed. Interviews were recorded in the original language. Narratives were then transcribed and translated into French in f4 version 4.0 and afterwards coded for thematic content by using MAXQDA version 10 (VERBI GmbH, Berlin, Germany). Categorical data from EMIC interviews was double-entered in EpiInfo version 3.5.1 (Centers for Disease Control and Prevention, Atlanta, GA) and converted to SAS version 9.2 (SAS Institute, Cary, NC) for statistical analysis. Ethical approval was obtained from the University of Kinshasa.

Statistical analysis. Responses to open questions of the EMIC interview were coded by using a list of predefined categories as follows. Spontaneously mentioned categories were coded and assigned a value of 2. Predefined categories that were not spontaneously mentioned were then probed further. If a category was reported in response to probing, a value of 1 was assigned. A value of 3 was added if the category was considered the most important. Frequencies were calculated for every category.

Determinants of anticipated vaccine acceptance were investigated by using multivariable logistic regression analysis. Because of a low variation of vaccine acceptability at a low price and at no cost, analyses were conducted for anticipated acceptance at a medium and high price only. First, univariable logistic regressions were conducted, including testing each item for interaction with site and sex. In a second step, three separate multivariable models were built for perceived causes, health seeking, and social impact. All response categories relating to the respective theme were entered into a multivariable model if either the P value for being associated with the dependant variable in the univariable analysis was < 0.2, or if the P value for interaction with sex or site was < 0.1. These models were additionally adjusted for socio-economic variables (focal models) and compared by using the Akaike Information Criterion. Finally, a comprehensive multivariable model was built for anticipated vaccine acceptance at the medium and the high price. Variables with P values < 0.2 for main effects or P values < 0.1 for interactions in the focal models were included. Variables were retained if their P value was still < 0.2 for main effects and < 0.1 for interaction terms, respectively.

RESULTS

Respondents characteristics. Overall, 181 women and 179 men of the general population 18–83 years of age (median = 36 years) were interviewed. An average household counted 6 persons including 3 children, and 72% of the households had a child < 5 years of age (Table 1). Most persons obtained incomes from agriculture, fishing, informal jobs, and petty trade, and had a median monthly household income of $15. Educational differences according to sex and site were observed: men and persons living in towns were more likely to have completed secondary or tertiary education.

TABLE 1
Characteristics of study population, Katanga Province, Democratic Republic of Congo

Sociodemographic characteristics (%)	Women (n = 181)	Men (n = 179)	P*	Rural town (n = 180)	Fishing village (n = 180)	P*
No education	9.4	3.4	< 0.05	5.0	7.8	
Primary school	54.7	35.8	< 0.001	35.0	55.6	< 0.001
Secondary school	33.1	51.4	< 0.01	51.1	33.3	< 0.01
Vocational school	2.2	1.7		2.2	1.7	
University	0.6	7.8	< 0.001	6.7	1.7	< 0.05
Married	78.5	83.8		78.3	83.9	
Mean age, years (median)	36.9 (35)	39.8 (38)	< 0.05	39.7 (38)	37.2 (35)	< 0.05
Mean household size (median)	6.3 (6)	6.1 (6)		6.1 (6)	6.3 (6)	
Mean no. children (median)	3.3 (3)	3.2 (3)		3.3 (3)	3.2 (3)	< 0.05
% Households with children < 5 years of age	72.9	70.9		70.6	73.3	
% Households with children 5–10 years of age	54.7	51.4		54.4	51.7	
% Households with children >10 years of age	48.6	45.2		48.3	45.6	
% Female-headed households	19.9	3.9	< 0.001	14.4	9.4	
Reliable income	31.5	39.1		29.4	41.1	< 0.05
Mean household income, US dollars (median)	42 (12)	55 (16)		49 (15)	47 (15)	
Main source of income						
Agriculture	31.5	29.6		50.0	11.1	< 0.001
Fishing	0.0	33.0	< 0.001	2.2	30.6	< 0.001
Self-employment	22.7	15.1		16.1	21.7	
Formal employment	2.2	15.6	< 0.001	9.4	8.3	
Housewife	35.9	0.0	< 0.001	10.6	25.6	< 0.001
Housemaid	0.6	0.0		0.6	0.0	
Casual laborer	2.8	3.9		4.4	2.2	
Student	1.1	1.7		2.2	0.6	
Not active/retired	2.8	1.1		3.9	0.0	< 0.01

*By Fisher's exact test.

Identification of illness and perceived symptoms. After introducing the vignette story of a child with acute watery diarrhea, 93% of the respondents associated the described illness episode with cholera. Most (99%) considered acute watery diarrhea in children as severe to very severe.

There was a general belief that everybody could be affected by this problem: adults and children (86.4%) and rich and poor (84.4%). Fifty-one percent of respondents knew a family or household member who had been affected by acute watery diarrhea, and in 11% a child was concerned. The latter differed considerably between sites: 16.7% had been affected in the town of Kasenga, compared with only 5.6% on the fishing island ($P = 0.001$).

Perceived causes of illness and related treatment practices. Respondents were asked to identify the perceived causes and illness-related treatment practices associated to the vignette-based case description. Contaminated water and food (86%), a dirty environment (87%) and lacking personal hygiene (85%), were by far the most common perceived causes of illness. Despite awareness of the pathways of infection for childhood diarrhea, magico-religious perceptions and practices pertinent to diarrhea continued to coexist. Several magico-religious causes were confirmed as potential underlying origins of disease: God's will (39%), the breach of a taboo (25%), eating forbidden food (20%), and witchcraft (51%). Witchcraft was much more prevalent on the fishing village but did not differ between men and women. Other health-related misconceptions, such as breastfeeding as a possible cause of diarrhea (48%), were also common in this area.

Reported initial treatment consisted of oral rehydration solution (58%), self-administered antibiotics (31%), or herbal medicines (17%). In addition to these initial self-treatments, respondents recognized the importance of taking a child with the symptoms as presented in the vignette to a clinic (99%). Despite the importance of magico-religious causes, only few respondents confirmed the options of using traditional protection (9%), and consulting a traditional practitioner (6%) or a faith healer (20%). Prayers were spontaneously mentioned by only 3%, but confirmed by 46% of the interviewees.

Perceived social impact of diarrheal illness. Potentially contagious diseases can disturb social relationships. Problems with social relationships (43%), that the child would be isolated from other people (38%), or fears to infect someone else (38%) were often mentioned. These fears were more pronounced in the fishing village as compared with town ($P = 0.030$, by Fisher's exact test).

Acceptability of vaccines as a way to prevent acute watery diarrhea in children. When respondents were asked about ways to prevent diarrhea, the most frequent spontaneous answer was provision of clean water and food. However, many persons revised their initial priority and gave preference to vaccines when asked about the most effective method. Respondents who preferred other means of prevention still considered the vaccine acceptable: 99% of the interviewees would vaccinate their children if the vaccine was provided free. Acceptability decreased slightly to 95%, 78%, and 68% at an assumed price of $1, $5, and $10.5, respectively. Most (87.8%) persons would vaccinate children and adults if the vaccine was available. Persons further believed that vaccines created no or only moderate problems, mainly fever in children which was mentioned by 20.3% of the respondents.

Socioeconomic determinants of anticipated vaccine acceptance. In a second step, we assessed whether socioeconomic characteristics and particular illness perceptions were associated with anticipated vaccine acceptance if the vaccine was assumed to cost $5 or $10.5.

Overall, education showed the strongest positive effect on anticipated vaccine acceptance at both price levels (Tables 2 and 3). In the rural site, younger age was equally associated with greater vaccine acceptability. A larger household was

TABLE 2

Sociocultural determinants of anticipated vaccine acceptance to prevent acute watery diarrhea in 360 children at an assumed cost of $5 (US), Katanga Province, Democratic Republic of Congo*

	Medium price ($5)					
	Focal models			Comprehensive model		
Determinant	OR	95% CI	*P*	OR	95% CI	*P*
Perceived causes						
Breach of a taboo	1.86	(0.94–3.66)	0.073		–	
Cholera caused by witchcraft						
Women, witchcraft	3.11	(1.42–6.81)	0.005	3.16	(1.34–7.41)	0.008
Men, witchcraft	1.01	(0.65–1.55)	0.981	0.81	(0.49–1.33)	0.399
Health seeking						
Rehydration at home	0.83	(0.70–0.99)	0.034		–	
Prayers at home	1.93	(1.20–3.09)	0.006	1.64	(1.04–2.57)	0.032
Faith healers	2.39	(1.16–4.94)	0.018		–	
Psychosocial impact						
Isolation from others	0.76	(0.60–0.97)	0.028	0.75	(0.58–0.98)	0.035
Fear of infecting others	0.65	(0.48–0.87)	0.004	0.65	(0.48–0.88)	0.006
Interference with daily activities	0.78	(0.61–1.00)	0.048		–	
Sociodemographic characteristics						
6–12 years of education (referent < 6 year)	7.75	(2.92–20.57)	0.0001	7.23	(2.52–20.81)	0.0001
> 12 years of education (referent < 6 years)	4.31	(1.63–11.36)	0.003	4.32	(1.50–12.48)	0.007
Household size > 1 person	0.90	(0.83–0.98)	0.0101	0.92	(0.85–1.00)	0.059

*OR = odds ratio; CI = confidence interval.

also associated with lower acceptability, but the association was significant only in the focal model at a medium price. Main source and magnitude of income and site did not show significant associations.

Efect of illness beliefs on anticipated vaccine acceptance. The perception of witchcraft as cause for diarrhea was the only perceived cause affecting vaccine acceptability after adjustment for covariates: Seemingly counter-intuitive, it increased anticipated vaccine acceptance among female respondents (Tables 2 and 3).

Like witchcraft beliefs, praying increased anticipated vaccine acceptance, but only in the medium price model (Table 3). In the focal models, consulting a faith healer had also been associated with increased vaccine acceptability, but when prayers were included in the comprehensive model, the effect became insignificant. Overall, treatment choices were not

TABLE 3

Sociocultural determinants of anticipated vaccine acceptance to prevent acute watery diarrhea in 360 children at an assumed cost of $10.5 (US), Katanga Province, Democratic Republic of Congo*

	High price ($10.5)					
	Focal models			Comprehensive model		
Determinant	OR	95% CI	*P*	OR	95% CI	*P*
Experiences						
Poor people are more affected						
Town: poor more affected	0.36	(0.15–0.86)	0.021	0.23	(0.09–0.61)	0.003
Rural: poor more affected	1.82	(0.56–5.88)	0.317	1.62	(0.46–5.68)	0.449
Perceived causes						
Drinking contaminated water	0.83	(0.71–0.96)	0.014		–	
Flies	0.80	(0.63–1.02)	0.072		–	
Worms	1.41	(0.86–2.32)	0.175		–	
Breach of a taboo	1.56	(0.86–2.83)	0.142		–	
Cholera caused by witchcraft						
Women, witchcraft	2.70	(1.42–5.11)	0.002	2.16	(1.14–4.07)	0.018
Men, witchcraft	1.01	(0.69–1.53)	0.954	1.09	(0.66–1.82)	0.741
Health seeking						
Rehydration at home	0.84	(0.7–1)	0.019	0.88	(0.76–1.03)	0.112
Prayers at home	1.34	(1–1.8)	0.056		–	
Faith healers	1.61	(1–2.6)	0.057		–	
Town: over counter antibiotics	0.82	(0.4–1.6)	0.570		–	
Rural: over counter antibiotics	3.76	(1.2–12)	0.024		–	
Psychosocial impact						
Isolation from others	0.72	(0.57–0.89)	0.003	0.76	(0.60–0.96)	0.021
Fear of infecting others	0.79	(0.61–1.03)	0.085	0.75	(0.56–1.00)	0.052
Interference with daily activities	0.66	(0.52–0.84)	0.001	0.68	(0.54–0.87)	0.002
Sociodemographic characteristics						
6–12 years of education (referent < 6 years)	3.37	(1.31–8.65)	0.012	3.15	(1.10–8.98)	0.032
12 years of education (referent < 6 years)	3.30	(1.27–8.56)	0.014	4.44	(1.49–13.21)	0.007
Town: age of parent	0.99	(0.97–1.02)	0.517	0.99	(0.96–1.02)	0.380
Rural: age of parent	0.96	(0.93–0.98)	0.001	0.96	(0.93–0.98)	0.002

*OR = odds ratio; CI = confidence interval.

TABLE 4
Explanatory power of focal models for the different themes (comparison of the corrected Akaike Information Criterion) for diarrhea in early childhood, Katanga Province, Democratic Republic of Congo

Model	Vaccine acceptance at medium price ($5 US)	Vaccine acceptance at high price ($10.5 US)
Psychosocial signs of distress	–18.7	–28.3
Home treatment	–16.1	–7.9
Perceived causes	–10.0	–14.5
Outside treatment seeking	–5.9	–5.5
Somatic signs of distress	–5.7	–6.0
Socioeconomic factors (comparison model)	0	0

significantly associated with anticipated vaccine acceptance in the comprehensive models.

Effect of psychosocial impact of childhood diarrhea on anticipated vaccine acceptance. The psychosocial dimension of illness also affected anticipated vaccine acceptance. Fears of infecting others and to be isolated from others were negatively associated with vaccine acceptability at both price levels (Tables 2 and 3). Fears of interferences of illness with daily life had a negative effect at the higher price. Similarly, associating the disease with poverty decreased anticipated vaccine acceptance, if a high price was assumed, but only in town. The relevance of the social impact of cholera for the acceptability of a vaccine is supported by the fact that the model including these factors had the greatest explanatory power when considering the Akaike Information Criterion (Table 4).

DISCUSSION

The high anticipated acceptance of an oral vaccine to prevent severe watery diarrhea suggests a high priority for the prevention of childhood diarrhea in the local communities. In both study sites, most respondents identified the type of diarrhea described in the vignette as cholera. Although the vignette did not mention cardinal symptoms like rice-water–like feces and muscle cramps, and could in fact represent many other gastrointestinal tract infections of children, such as rotavirus, *E. coli*, or human immunodeficiency virus–related opportunistic infections, the differentiation of pathogens and associated clinical symptoms was not a consideration for respondents' identification of the type of childhood diarrhea. The fact that both communities experienced several large cholera outbreaks in recent years may explain instead why most respondents associated the described illness episode directly with cholera.

Respondents emphasized the lack of clean water and the dirty environment as most important causes of diarrheal illness in childhood. However, there was a predisposition to prefer vaccines when asked for the most important way to prevent childhood diarrhea. This inconsistency between cause and prevention may mirror some frustration with the failure of the government to implement a sustainable water and sanitation infrastructure in the area.

Anticipated acceptance of vaccines to prevent acute watery diarrhea in childhood was nearly universal if no cost was implied (99%). However, costs affected anticipated acceptance, which decreased to 68% if the vaccine was expected to cost $10.5. Given a median household income of $15, the actual ability to meet this expense is likely to be overestimated. This finding is a general problem of studies in which costs are anticipated and no actual decision on expenditure has to be taken (hypothetical bias).[44] Nonetheless, the high rate of hypothetical acceptance supports that there is a high perceived need for a vaccine in the communities, which is supported by the fact that vaccines were considered the preferred way of prevention.

Because anticipated acceptance of a free vaccine was universal, factors influencing anticipated acceptance could only be studied when some cost was assumed. For the costs of $5 or $10.5, anticipated vaccine acceptance increased with a higher educational level of the respondents. This finding is consistent with findings of many studies that examined determinants of immunization.[45–48] However, education did not offset the influence of magico-religious beliefs and practices. Beliefs in witchcraft were also associated with anticipated acceptance of a vaccine, albeit in a seemingly paradoxical way. Women who suspected witchcraft as a possible cause of childhood diarrhea were more likely to anticipate vaccine acceptance. A study in the Gambia equally suggests that witchcraft beliefs are not necessarily competing with vaccination campaigns.[31] Prevailing gender inequality may offer an explanation for this paradox. In many societies, women tend to be blamed for their children's illness. Mothers may then resort to witchcraft assumptions to answer the allegation.[47,49,50] As a consequence, this finding may enforce their interest in prevention.

Religious practices were also associated with increased vaccine acceptability, but in this case the association was relevant for men and women. There are several possible explanations. Respondents who pray for healing may perceive a greater risk. Alternatively, a positive attitude of the local Catholic church towards health education and vaccinations may influence people's attitudes. A third explanation lies in the social role of church membership, which may strengthen social support networks and help to mobilize resources for health services. It has been shown in other contexts that membership in social groups is critical for the mobilization of the necessary financial means for healthcare for people with limited resources.[51]

The analysis further showed that psychosocial implications of illness contribute to the explanation of anticipated vaccine acceptance. Respondents who emphasized fear of being isolated and of infecting others were less likely to pay $5 of $10.5 for a vaccine. At first sight, we would expect respondents who fear the social implications of illness expressing a greater interest in a vaccine for prevention. Another explanation emerges if we consider social dynamics in addition to individual considerations. There is a possibility that persons who fear social implications most tend to be already marginalized in their communities. From other studies, we know that persons at the margins of their societies have more problems in accessing vaccination services.[52–54]

Although a high rate of anticipated acceptance of a vaccine does not represent actual vaccine acceptance, it indicates a perceived need for the prevention of childhood diarrhea, and suggests little objection towards the introduction of vaccinations. No differences in vaccine acceptability were found between parents of young children and other respondents in our study. The main aim of this study was to highlight the importance of sociocultural factors for anticipated vaccine acceptance on the population level for the two selected communities. The cultural epidemiology approach clarifies the distribution of ideas, perceptions, and preferences in the community, which is not usually considered in classic epidemiologic or qualitative approaches. To further clarify social dynamics

that affect uptake of vaccines once a program is in place, additional qualitative in-depth analyses will be needed.

Results suggest a high demand of vaccines to prevent childhood diarrhea. Although promising, this finding should be viewed with caution. There is a limitation of the effectiveness of diarrhea vaccines. Diarrhea, as described in this vignette, can be caused by a large variety of organisms, and only a few are preventable by vaccines. If a vaccine for rotavirus and/or cholera is introduced in a community, the clinical picture of acute watery diarrhea will not fully disappear. This finding needs consideration in the communication of any vaccination campaign, especially in areas in which contagion may not be the only culturally legitimate explanation for diarrheal illness. Furthermore, the common misperceptions of the origins of childhood diarrhea may have to be countered with sensitization campaigns, emphasizing the need for immediate treatment of childhood diarrhea and the value of vaccination for prevention. Therefore, possible future vaccination campaigns may be best combined with health education programs to inform persons about childhood diarrhea.

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Authors' addresses: Sonja Merten, Christian Schaetti, and Mitchell Weiss, Department of Epidemiology and Public Health, Swiss Tropical and Public Health Institute, Socinstrasse 57, Basel 4002, Switzerland, E-mails: sonja.merten@unibas.ch, christian.schaetti@unibas.ch, and mitchell-g.weiss@unibas.ch. Cele Manianga and Bruno Lapika, Institut d'Anthropologie, Université de Kinshasa, Kinshasa, Democratic Republic of the Congo, E-mails: cmanianga@gmail.com and lapikadi@yahoo.fr. Raymond Hutubessy, Initiative for Vaccine Research, World Health Organization, Geneva, Switzerland, E-mail: hutubessyr@who.int. Claire-Lise Chaignat, Global Task Force on Cholera Control, World Health Organization, Geneva, Switzerland, E-mail: chaignatc@who.int

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