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3 SUPPLEMENT TITLE:

4 *Every Newborn* BIRTH multi-country validation study: informing measurement of coverage  
5 and quality of maternal and newborn care

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7 PAPER TITLE:

8 Respectful maternal and newborn care: measurement in one EN-BIRTH study hospital in  
9 Nepal

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## 36 **ABSTRACT**

### 37 **BACKGROUND**

38 Respectful maternal and newborn care (RMNC) is an important component of high-quality care but

39 progress is impeded by critical measurement gaps for women and newborns. The *Every Newborn*

40 Birth Indicators Research Tracking in Hospitals (EN-BIRTH) was an observational study with mixed

41 methods assessing measurement validity for coverage and quality of maternal and newborn

42 indicators. This paper reports results regarding the measurement of respectful care for women and

43 newborns.

44

### 45 **METHODS**

46 At one EN-BIRTH study site in Pokhara, Nepal, we included additional questions during exit-survey

47 interviews with women about their experiences (July 2017-July 2018). The questionnaire was based

48 on seven mistreatment typologies: Physical; Sexual; Verbal; Stigma/discrimination; Failure to meet

49 professional standards of care; Poor rapport between women and providers; and Health care denied

50 due to inability to pay. We calculated associations between these typologies and potential

51 determinants of health – ethnicity, age, sex, mode of birth – as possible predictors for reporting poor

52 care.

53

54 **RESULTS**

55 Among 4,296 women interviewed, none reported physical, sexual, or verbal abuse. 15.7% of women  
56 were dissatisfied with privacy, and 13.0% of women reported their birth experience did not meet  
57 their religious and cultural needs. In descriptive analysis, adjusted odds ratios and multivariate  
58 analysis showed primiparous women were less likely to report respectful care ( $\beta= 0.23$ , p-value  
59  $<0.0001$ ). Women from Madeshi (a disadvantaged ethnic group) were more likely to report poor  
60 care ( $\beta=-0.34$ ; p-value 0.037) than women identifying as Chettri/Brahmin. Conversely women who  
61 had caesarean were less likely to report poor care during childbirth ( $\beta=-0.42$ ; p-value  $<0.0001$ ) than  
62 women with a vaginal birth. However, babies born by caesarean had a 98% decrease in the odds  
63 (aOR=0.02, 95% CI, 0.01-0.05) of receiving skin-to-skin contact than those with vaginal births.

64

65 **CONCLUSIONS**

66 Measurement of respectful care at exit interview after hospital birth is challenging, and women  
67 generally reported 100% respectful care for themselves and their baby. Specific questions, with  
68 stratification by mode of birth, women’s age and ethnicity, are important to identify those  
69 mistreated during care and to prioritise action. More research is needed to develop evidence-based  
70 measures to track experience of care, including zero separation for the mother-newborn pair, and to  
71 improve monitoring.

72

73 **Keywords:** Respectful maternal and newborn care, mistreatment, Nepal, maternal, newborn,  
74 coverage, respect, privacy, delivery, standard of care

75

76 **Key findings**

What is known and what is new about this study?
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- Whilst ~80% of births globally are now in health facilities; previous studies have estimated that 19-98% women worldwide experience disrespect and abuse during hospital birth.
- The experience of care for women, newborns and their families around the time of birth is increasingly recognised as a global priority and an essential dimension of quality of care, but accurate measurement, and especially routine tracking are challenging.
- This study in Pokhara Nepal (an EN-BIRTH study site), captured respectful maternal and newborn care (RMNC) in exit-survey after hospital birth using seven typologies (n=4296).

#### **Measurement—what did we find and what does it mean?**

- *Standards of care showed a wide range:* we found very low exit-survey reported coverage of specific questions regarding standards of care, such as 0.3% of women having a companion of choice and 0.5% having skin-to-skin contact with their baby. This contrasted with consistently high (100%) women's exit-survey report regarding treatment with dignity and respect, or absence of abuse.
- *Question design mattered:* When asked more general survey questions, all women denied physical/sexual/verbal abuse, and expressed they had been treated with respect and dignity. However, more specific questions including regarding preservation of privacy, support meeting religious/cultural needs, access to their chosen birth companion, skin-to-skin contact, and breastfeeding counselling after birth revealed gaps in service provision.
- *Women's characteristics:* Primiparous women were more likely to report non-respectful care.
- *Variation with mode of birth:* Women who had caesarean had a 98% decrease in the odds (aOR=0.02, 95% CI, 0.01-0.05) of receiving skin-to-skin contact with their baby than those with vaginal births. Women who had caesarean were more likely to report respectful care during childbirth ( $\beta=-0.402$ ; p-value <0.0001) than women with vaginal births.

### What next and research gaps?

- Exit interview surveys underestimate a negative experience of care, even with an independent interviewer. Further improvement in measurement of more tangible events (privacy, companionship, separation) in large-scale household surveys linked to other data sources (such as service readiness surveys) is needed.
- Specific indicator measurement testing including validity for experience of newborn care (e.g. skin-to-skin contact as a proxy for zero separation) could be assessed for potential use as a tracer indicator of RMNC in different information systems.
- Considering the profile of the family, and the mode of birth is important to capture inequalities in respectful care and to prioritise gaps for action.
- Research is needed to understand if improving experience of care for vaginal births may help curb rising caesarean section rates.

77

### 78 **BACKGROUND**

79 Annually, almost 80 million babies are now born in health facilities [1], a 50% increase in the last 20  
80 years especially in low- and middle-income countries (LMICs) [2]. This is a major result of key  
81 investments to bring global attention to improving women's health [3], with an additional 3 million  
82 maternal and neonatal deaths estimated to have been averted in 2018 [4]. However, poor quality of  
83 care at the time of facility birth remains a contributor to around 66% of the 2.4 million neonatal deaths  
84 globally each year [4-6]. High-quality health systems with quality of care for facility birth could prevent  
85 an estimated 1 million newborn deaths and half of all maternal deaths every year [7].

86

87 Quality of care has two dimensions – provision and experience of care [8, 9]. Provision of quality of  
88 care is essential and describes the content and quality of clinical interventions and services. However,

89 without a positive user-experience across all domains of the WHO respectful care framework [9],  
90 families may lose trust in services. Evidence shows that women who were mistreated during labour  
91 and birth are hesitant to engage with postnatal services, irrespective of whether provision of care is  
92 in accordance with clinical guidelines [8, 10, 11]. Many studies in the last decade have highlighted  
93 mistreatment of women during labour in low- and middle-income countries (LMICs) [12-14], including  
94 physical and verbal abuse, discrimination based on maternal age (young or elderly), and ethnicity or  
95 social class [15, 16]. Other manifestations of mistreatment included the provision of care without  
96 consent, obstructing the presence of a birth companion, and withholding food during labour without  
97 the woman's consent or a clinical indication [15, 17]. In contrast, respectful care is synonymous with  
98 a positive user experience and should include women and families as active-participants throughout  
99 pregnancy and childbirth [18]. Respectful care for newborns is a more recent concept; efforts are being  
100 made to define and agree on an expanded typology of respectful care that is more inclusive of the  
101 newborn [19]. The White Ribbon Alliance's (WRA) Respectful Maternity Care Charter outlines the  
102 rights of women and newborns during childbirth and the postnatal period [20], but there is very  
103 limited evidence regarding how to measure such inclusive respectful maternal and newborn care  
104 (RMNC) in practice.

105

106 WRA outline that provision of respectful care demands health systems services and workers are able  
107 to meet families' cultural and religious needs [20]. These are often defined by local culture, tradition  
108 and beliefs influence the choice of birth place, preference of support person, and a woman's sense of  
109 control and safety [21]. In Nepal, as in many settings, cultural beliefs and practices around childbirth  
110 vary between different communities and create both opportunities and barriers for uptake of services  
111 and interventions (e.g. facility birth) [22]. This adds complexity when considering implementation  
112 approaches and envisioning contextually relevant, validated measurement tools to track RMNC.

113

114 Although emergency caesarean section can be a life-saving intervention for a woman or her baby  
115 facing complications during labour, escalating global caesarean rates suggest overuse in both high-  
116 and low-resource settings [23-26]. In recent years, the southeast Asian region has seen the caesarean  
117 rate increase from 4.4% to 19.2% [25], with Nepal highlighted as one of the countries with the highest  
118 increase in caesarean rates, especially among the richest fifth of the population [23]. However, little  
119 is yet known about how mode of birth impacts the family experience of care or the measurement of  
120 RMNC.

121

122 Improving RMNC requires a health systems approach to support frontline health workers' capacity to  
123 facilitate a positive experience of care [27]. A recent study highlighted that many health systems  
124 struggle to support family/woman-centred care [17]. This gap in service provision could risk a decline  
125 in facility births, and reverse the hard-won momentum for improving outcomes for maternal and  
126 newborn survival and reducing stillbirths. Despite this, a recent review of facility assessment tools  
127 found that measures of care experience were least likely to be included [28].

128

129 Tracking progress on respectful care is necessary to improve quality of care, but currently there is a  
130 lack of consensus regarding what is best to measure based on the WHO standards of care and  
131 specific goals and targets [9, 29]. Moreover, there is limited evidence on the different measurement  
132 options, including exit interviews after facility births, household surveys, independent observation,  
133 or capturing respectful care in routine health management information systems (HMIS) [12].

134 Concerns exist that implementation of poor data collection methods to capture these complex and  
135 sensitive data [30] result in an underestimate of the true prevalence [31].

136

137 The *Every Newborn* Action Plan (ENAP) agreed by all United Nations member states and >80  
138 development partners, includes an ambitious Measurement Improvement Roadmap with an urgent  
139 focus on validating measurement of indicators for care and outcomes around the time of birth [32].

140 As part of this roadmap, The *Every Newborn* - Birth Indicators Research in Hospitals (EN-BIRTH) study  
141 was a mixed-methods observational study of >23,000 facility births in three countries (Tanzania,  
142 Bangladesh and Nepal). EN-BIRTH aimed to test the validity of measurement for selected newborn  
143 and maternal indicators for routine facility-based tracking of coverage and quality of care [33, 34].

144

## 145 **OBJECTIVES**

146 This paper is part of a supplement based on the EN-BIRTH multi-country validation study, *'Informing*  
147 *measurement of coverage and quality of maternal and newborn care'*. We focus on exit survey-  
148 reported RMNC at one EN-BIRTH study site in Nepal, with three objectives:

- 149 1. **Analyse EXIT SURVEY-REPORTED EXPERIENCE OF CARE FOR WOMEN** after facility birth  
150 (selected maternal respectful care components, based on Bohren et al [12]).
- 151 2. **Describe women's EXIT SURVEY-REPORTED COVERAGE OF FACILITY-BASED NEWBORN**  
152 **CARE** practices around the time of birth (selected newborn respectful care components).
- 153 3. **Conduct multivariate regression analysis regarding DETERMINANTS OF SURVEY-REPORT** by  
154 women, including mode of birth, and demographic and social characteristics.

155

## 156 **METHODS**

157 EN-BIRTH was an observational mixed-methods study to validate measurement of selected maternal  
158 and newborn indicators in survey and routine recording. Data were collected between July 2017 and  
159 July 2018 in five public hospitals providing comprehensive emergency obstetric and neonatal care  
160 (CEmONC) in three high-burden countries: Bangladesh (BD), Nepal (NP) and Tanzania (TZ). Detailed  
161 information regarding the research protocol, methods and analysis has been published separately  
162 [32]. This paper focuses on the measurement of respectful care of women and newborns, obtained  
163 from exit surveys, at Pokhara Academy of Health Sciences, where questions pertaining to RMNC  
164 were added to the standard EN-BIRTH exit interview survey as part of the Nepal Perinatal Quality  
165 Improvement Project (NePeriQIP) [33].



166

167 Women were recruited in early labour and voluntary informed written consent was obtained from  
168 all study participants. Participants were assured of anonymity and confidentiality, although there  
169 were recognised challenges for using facility-based survey tools for this topic. Results are reported in  
170 accordance with the STROBE Statement checklist for cross-sectional studies (Additional file 1).

171

## 172 **Tool development and data collection**

173 For this study, women’s experience of care during childbirth and sociodemographic information  
174 were collected using a semi-structured questionnaire administered at the time of discharge. We  
175 used 11 questions to assess mistreatment of women and newborns during childbirth and the  
176 postnatal period using the “abuse and disrespect” typology based on systematic review by Bohren et  
177 al [12](Additional file 2). The respectful maternity care structured questionnaire was designed in  
178 English, translated into Nepali, then independently back-translated and finalised after pilot testing  
179 [38]. Data were collected on paper-based forms and checked for completeness. Every month,  
180 researchers observed a 5% sample of data collector interviews in order to assess adherence to the  
181 research protocol. Feedback and training were provided to data collectors when necessary. Data  
182 were digitalized and stored in the CS-PRO database. Data were backed up weekly using an external  
183 hard drive and stored in a locked vault. Paper forms were stored in locked cabinets as per the data  
184 security protocol. Women who consented to be part of this study were tracked from admission until  
185 discharge. Community follow-up was not possible and is a noted limitation of this study. All  
186 caesarean sections were undertaken using epidural anaesthesia.

187

## 188 **Objective 1: Respectful maternal care**

189 A descriptive analysis on the coverage gaps for respectful maternity care was done based on the  
190 seven typologies of mistreatment [12]:

191

192 (1) Physical, (2) Sexual, and/or (3) Verbal abuse

193 • Were you or your newborn physically, verbally or sexually abused during labour or childbirth  
194 or after birth?

195 • Were you treated in a bad way?

196

197 (4) Stigma and discrimination

198 • Did the health service meet your religious and cultural birthing practice needs?

199 • Were you treated with respect?

200 • Was your dignity preserved during your stay at the hospital?

201

202 (6) Poor rapport between woman and provider

203 • Ineffective communication

204 ○ Are you satisfied with the health education and information you received from  
205 health care providers?

206 ○ Were you given the opportunity to discuss any concerns and preferences?

207 • Are you satisfied with the degree of privacy received during your stay at the hospital?

208

209 (7) Health system constraints

210 • Were you refused care because of your inability to pay?

211 • Are you satisfied with the degree of privacy received during your stay at the hospital?

212

213 **Objective 2: Respectful newborn care**

214 A descriptive analysis on the coverage gaps for respectful newborn care was done based on the  
215 seven typologies of mistreatment [12]:

216

217 (1) Physical, (2) Sexual, and/or (3) Verbal abuse

218 • Were you or your newborn physically, verbally or sexually abused during labour or childbirth  
219 or after birth?

220 • Were you treated in a bad way?

221

222 (5) Failure to meet professional standards of newborn care

223 • Have you kept your baby in skin-to-skin contact immediately after birth?

224 • Did a health worker examine your baby when you were present?

225

226 (6) Poor rapport between woman and provider

227 • Ineffective communication

228 ○ Did you receive written or verbal information and counselling on exclusive  
229 breastfeeding until 6 months before discharge?

230

231 **Objective 3: Association between reporting of poor care with socio-demographic and obstetric**  
232 **characteristics**

233 Amongst mothers who reported mistreatment of themselves or their newborn, a test of association  
234 with age, ethnicity and mode of birth was done using an unpaired student t-test. Categorical variable  
235 groups were made for age, ethnicity, parity and mode of birth. Two groups were identified based on  
236 ethnicity/religion; an advantaged group (women identifying as Chettri/Brahmin and others) and a  
237 disadvantaged group (participants identifying as Dalit; Janjati; Madhesi or Muslim) [34, 35]. Parity  
238 data were combined into three groups (no previous birth, 1 previous birth, and 2+ previous births).  
239 Mode of birth was analysed by vaginal birth (spontaneous or assisted) and caesarean section births.  
240 Missing values in each variable were reported and excluded for this analysis. We have excluded data  
241 with very high (>90%) or low (<10%) proportions of “Yes” replies resulting in low variance (less than  
242 10%).

243

244 Multivariable logistic regression models were fitted to evaluate whether age, ethnicity, mode of  
245 birth, parity or baby's sex could be a predictor of women reporting non-respectful care. If any level  
246 of association was observed in the logistic regression analysis, the variables were taken for multi-  
247 nominal regression analysis, which included women's reports of whether the health service met  
248 religious and cultural birthing practice needs, and privacy during the hospital stay.

249

## 250 **RESULTS**

251 During the study period, 6,922 women had exit interviews for the NePeriQIP study, of which 4,296  
252 (62.1%) ID-matched for the EN-BIRTH study and are reported here (Figure 1). The mean age of exit-  
253 survey respondents was 24 years, 48.1% of participants identified as Chettri/Brahmin, and >90% of  
254 women gave birth at term (Table 1, additional file 3). We report results in accordance with the  
255 disrespect and abuse typologies (Table 2).

256

### 257 **Objective 1: Respectful maternal care**

258 Among the participants enrolled at exit interview (n=4,296), there were no reports of any physical,  
259 sexual or verbal abuse (Table 2). All women (100%) reported that they had been treated with  
260 respect and dignity. More specific questions regarding stigma and discrimination found that 87.0%  
261 (95% CI, 85.9-88.0) of women reported their experience of birth had met religious and cultural needs  
262 whilst 84.3% (95% CI, 81.9-86.7) were satisfied with privacy during their stay in hospital. Satisfaction  
263 with health education and information from the health care providers, and the opportunity to  
264 discuss any concerns and preferences was 100% at exit-survey report. However, only 0.3% (95% CI,  
265 0.2-0.6) of women reported receiving written or verbal information/counselling on nutrition or  
266 healthy eating. None of the women were refused care because of an inability to pay.

267

### 268 **Objective 2: Respectful newborn care**

269 All women reported that their baby was treated with respect and dignity, with no abuse on exit  
270 interview. Reported standards of care were lower with only 18.7% (95% CI, 17.6-19.9) of women  
271 saying that they initiated skin-to-skin contact with their baby immediately after birth (Table 2).  
272 99.9% of women reported that their baby was examined in their presence. All women reported  
273 receiving breastfeeding counselling.

274

275 **Objective 3: Association between reporting of poor care with socio-demographic and obstetric**  
276 **characteristics**

277 Women identifying as Chettri/Brahmin were most likely to give birth by caesarean section  
278 (Additional file 4). Women aged <20 years (n=563) were most likely to report having their religious  
279 and cultural needs met (92.4 95% CI 89.9, 94.3) but least likely to report having skin-to-skin contact  
280 with their newborns immediately after birth (16.7%, 95%CI 13.8-20.0), compared to women in other  
281 age groups (Table 3). Almost all women who delivered via caesarean section (n=602) reported that  
282 their cultural needs had been met (98.3%, 95% CI, 96.9-99.1) and had high satisfaction regarding  
283 privacy (97.3%, 95% CI, 92.2-100.0), compared to those after vaginal birth. Babies born by caesarean  
284 were least likely to receive immediate skin-to-skin care (0.5%, 95% CI, 0.2-1.5), compared to those  
285 born by vaginal birth (Table 3).

286

287 Women with no previous births had higher odds of reporting disrespectful care, with an adjusted  
288 odds ratio (aOR) of 2.51 (95% CI 1.74, 3.61) for reported failures to maintain privacy and 2.20 (95%  
289 CI, 1.45, 3.43) for not meeting cultural and religious needs (Table 4). Ethnicity was a risk factor for  
290 women identifying as Dalit, Janjati, Madeshi, or Muslim; they had 25 times higher odds (aOR 1.25,  
291 95% CI 1.04, 1.50) than those identifying as Chettri/Brahmin. Women who underwent caesarean  
292 section were more likely to report privacy was maintained than those who had vaginal birth (aOR  
293 0.11, 95% CI 0.06, 0.19). However, babies born via caesarean section had 98% decrease in the odds

294 (aOR=0.02, 95% CI, 0.01-0.05) of receiving skin-to-skin immediately after birth compared with  
295 vaginal births.

296

297 After adjusting for potential confounders (ethnicity, age, parity and mode of birth), we found that  
298 women with no previous births were more likely to report poor care during childbirth ( $\beta = -0.23$ ; p-  
299 value,  $<0.0001$ ), compared with those who had 2 or more previous births. Women from Madeshi  
300 (relatively disadvantaged group) were more likely to report non-respectful care during childbirth ( $\beta =$   
301  $-0.34$ ; p-value, 0.037) than those identifying as Chettri/Brahmin (relatively advantaged group) (Table  
302 5). Women who had caesarean birth had lower reporting of poor care during childbirth ( $\beta = -0.42$ ; p-  
303 value,  $<0.0001$ ) compared with those who had a vaginal birth (Table 5). There was no reported effect  
304 regarding the sex of the baby (Tables 4 and 5).

305

## 306 **DISCUSSION**

307 In this large-scale study, we attempted to measure the coverage of elements of RMNC during  
308 childbirth and look at factors associated with women and newborns not receiving respectful care.  
309 The reported prevalence of positive maternity care experiences varied by typology from 0.3-100%.  
310 When women were asked about physical/sexual and verbal abuse, none reported the event.  
311 Women stated they had been respected during birth in hospital and were satisfied with the  
312 information received about their care, their ability to express any concerns, and the health  
313 education they received. However, more specific questions around issues that have been widely  
314 defined as mistreatment revealed concerns regarding a lack of privacy and religious/cultural needs  
315 not being met. No one reported care being denied due to inability to pay, although this is probably  
316 because health care for pregnant women and newborns is free at the point of access in Nepal's  
317 public sector.

318

319 Given the very high level of satisfaction reported for some questions, we recognise that our findings  
320 might reflect the challenges of measuring RMNC in exit-survey. Evidence from Tanzania and Ethiopia  
321 suggests that self-reported levels of abuse are lower in facility-based exit interview surveys  
322 compared to the levels of disrespect recorded in observation or home-based surveys at a later date  
323 [10, 36, 37]. For example, in the same Tanzanian facility, self-reported levels of mistreatment were  
324 9.9%, compared to an observer-assessed prevalence of 69.8%. Instead of reflecting real levels of  
325 care, the lower reporting of disrespect in these studies may be related to the proximity of women to  
326 the facility and their care givers. Given exit-survey interviews are cheaper and more practical than  
327 other forms of research, including home interviews, a better understanding of what can be reliably  
328 measured using such tools is needed.

329

330 Within our study population, it's possible that disrespect was "internalized and normalized" by  
331 women, and that women did not have high expectations of how they would be treated by health  
332 workers [37, 38]. Concepts of respectful maternal – and even more with newborn – care cover a  
333 number of components which may, or may not be, considered as 'disrespectful' by women. There is  
334 an overlap between respectful care, good quality care, and good clinical care that is not always easy  
335 to disentangle. In accordance with the '*bullseye*' approach, perceptions of mistreatment can be  
336 conceptualised across three main groups: actions garnering wide consensus as disrespectful (e.g.  
337 beating a woman), normalized actions constituting mistreatment (e.g. failing to gain informed  
338 consent), and structural issues such as deviations from national protocols that women may not even  
339 recognize as problematic and might believe represent good quality of care (e.g. application of fundal  
340 pressure during the second stage of labour, or being denied food during labour and birth) [39]. Our  
341 findings showed respectful care was more likely to be reported by women after caesarean section  
342 than those who had a vaginal birth; this could be a manifestation of such structural issues. In  
343 Pokhara Hospital, women having caesareans are less likely to share a bed and are monitored more  
344 closely in the immediate postnatal period, which may also contribute to an increased feeling of

345 satisfaction with standards of care. In many settings, higher socio-economic status is associated with  
346 both a higher prevalence of caesarean section and more respectful care [17]. Measurement tools for  
347 RMNC clearly require validation at a local level.

348

349 A review mapping evidence around the mistreatment of newborns against seven commonly  
350 implemented respectful care typologies exposes critical newborn gaps in these tools and the  
351 importance of considering additional categories (such as legal accountability and bereavement care)  
352 [19]. Moreover, many research tools assessing respectful care have observations of childbirth  
353 stopped shortly after delivery and may therefore exclude critical aspects of respectful newborn care  
354 [13, 36-38]. As aforementioned, evidence from this study suggests key components of what others  
355 have defined as respectful newborn care may not be recognized by women as such [40]. Since  
356 respectful newborn care is difficult to define and consequently to measure, we suggest agreeing on  
357 measurable indicators that make sense to women, such as zero separation, skin-to-skin contact,  
358 breastfeeding support, and delayed bathing for 24 hours.

359

360 Measures of RMNC should also be included as part of service readiness assessments, routine facility-  
361 based data for HMIS, and in other health system monitoring and evaluation tools. Measures of birth  
362 companionship [41, 42], ability to provide privacy, facility to keep women and newborns together,  
363 and availability of a clean environment (including bathrooms) should be considered. There is  
364 qualitative evidence from multiple settings that women recognise limitations in health workers'  
365 capacity to provide RMNC, and that not all health facilities provide an enabling environment [43-45].  
366 Lack of infrastructure is an attributing factor to mistreatment [46]. The mistreatment of women is  
367 not exclusively caused by incompetent health workers, but is related to systemic health systems and  
368 social challenges [47]. Absence of training regarding dignified care, poor infrastructure, high  
369 workloads, social and institutional normative values, availability of resources and health system  
370 hierarchies can impede provision of respectful care [46, 47]. Responsibility for improving respectful



371 care is not limited to health workers, but is a function of routine health systems, which must be held  
372 to account [12]. To this end, measures of service readiness for provision of RMNC should be  
373 instituted within standard health facility assessment tools and processes, although currently  
374 measures of experience of care are most likely to be excluded [28].

375

376 Immediate skin-to-skin contact for newborns is seen as a key component of respectful newborn care  
377 [19], but coverage in Nepal was low. Skin-to skin-initiation was lowest for babies born by caesarean  
378 (0.5%) compared to those with vaginal/assisted births (21.7%). Delayed initiation of skin-to-skin may  
379 be justifiable if general anaesthesia is required and in some clinical emergencies, but for the majority  
380 of newborns this represents a critical gap in care [48]. These findings highlight an urgent  
381 requirement for improved evidence to support an expanded typology of respectful care that  
382 intentionally includes newborns [19], and highlights the importance of disaggregating data by mode  
383 of birth. This was a recurrent theme across the EN-BIRTH study [49-52].

384

385 There is growing evidence emphasizing the imperative to stratify RMNC data by sociodemographic  
386 characteristics, level of education, and ethnicity. In our study, women from advantaged ethnic  
387 groups had higher coverage of respectful care than those from disadvantaged groups. A systematic  
388 review of 14 studies on disrespect and abuse of women during childbirth in Nigeria showed  
389 exposure to abusive behaviours was influenced by low maternal socioeconomic status, and lack of  
390 education and empowerment of women [15]. In Nepal, like many other settings, caste and ethnicity  
391 are a key determinant of social hierarchy and impact on access to care [35]. Families from higher  
392 castes and relatively advantaged ethnic groups are more likely to receive higher quality of care [34,  
393 53], and have more access to facility birth [54, 55]. Qualitative data to explore these differences  
394 would be helpful to better understand if findings are related to local normative values and potential  
395 issues of stigmatisation, or data collection methods.

396

397 **Strengths and limitations**

398 This study is an important contribution to the literature assessing measures and measurement  
399 approaches to tracking RMNC, especially given the large sample size. All interviews were conducted  
400 by female research nurses with standardised training, but there were some limitations. Data were  
401 collected using exit-interview survey rather the gold standard of observation. As discussed, women  
402 could have been reporting high levels of respectful care because they were afraid that their answers  
403 would get back to the health providers, or because they had such low expectations of care that they  
404 were happy with what they received. Respectful care for mothers and newborns is a complex topic  
405 and we were not able to explore all facets of the concept within this study, including aspects such as  
406 availability of water, food, washroom facilities and latrines. We were not able to measure the socio-  
407 demographic characteristics of women, including number of years in education and wealth quintiles,  
408 although these have been associated with experiences of disrespect in other settings [10, 38, 42].  
409 While exit-survey interviews are practical and lower cost, further measurement research using other  
410 methods, such as phone or household visit interviews, are needed to gain a better understanding of  
411 the reliability of measuring experience of care.

412

413 **CONCLUSIONS**

414 Reducing mistreatment at birth requires health systems reform to promote and enable respectful  
415 care of mothers and newborns around the time of birth. Reliable tracking of valid RMNC measures is  
416 imperative to support and accelerate these advances. In our study, as with many others, measuring  
417 RMNC by exit interview after hospital birth gave mixed results. All women denied disrespect, abuse  
418 and ineffective communication when asked using general questions. Yet more specific detailed  
419 questions about stigma and discrimination revealed issues regarding privacy and cultural/religious  
420 needs not being met. More research is needed to develop evidence-based measures to track  
421 experience of care, including zero separation of mothers and their babies, and to improve

422 monitoring across a range of measurement platforms. Respectful maternal and newborn care should  
423 remain a priority in future research building on these findings.

424

425

## 426 **ABBREVIATIONS**

427 **aOR**, Adjusted odds ratios

428 **CEmONC**, Comprehensive emergency obstetric and newborn care

429 **cOR**, Crude odds ratios

430 **CIFF**, Children’s Investment Fund Foundation

431 **ENAP**, *Every Newborn* Action Plan now branded as *Every Newborn*

432 **EN-BIRTH**, *Every Newborn-Birth Indicators Research Tracking in Hospitals* study

433 **HMIS**, Health management information systems

434 **LMIC**, Low- and middle-income country/countries

435 **LSHTM**, London School of Hygiene & Tropical Medicine

436 **NePeriQIP**, Nepal Perinatal Quality Improvement Project

437 **RMNC**, Respectful maternal and newborn care

438 **USAID**, United States Agency for International Development

439 **WRA**, White Ribbon Alliance

440 **WHO**, World Health Organization

441

## 442 **DECLARATIONS**

443 [Ethics and consent to participate](#)

444 This study was granted ethical approval by institutional review boards in all operating counties in  
445 addition to the London School of Hygiene & Tropical Medicine (Additional file 5).

446 Voluntary informed written consent was obtained from all observed participants, their families for  
447 newborns, and respondents for the qualitative interviews. Participants were assured of anonymity

448 and confidentiality. All women were provided with a description of the study procedures in their  
449 preferred language at admission, and offered the right to refuse, or withdraw consent at any time  
450 during the study.

451 EN-BIRTH is study number 4833, registered at <https://www.researchregistry.com>.

452 NePeriQIP is registered in ISRCTN as <https://doi.org/10.1186/ISRCTN30829654>.

453

#### 454 [Consent for Publication](#)

455 Non-applicable.

456

#### 457 [Availability of data and material](#)

458 The datasets generated during and/or analysed during the current study are available in GC Data  
459 repository, <http://goldencommunity.org.np/ENBIRTHRMC>.

460

#### 461 [Competing interests](#)

462 The authors declare that they have no competing interests.

463

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472 submission decision.

473

474 [Authors' contributions](#)

475 AKC conceived the NePeriQip study. The EN-BIRTH study was conceived by JEL, who acquired the  
476 funding and led the overall design with support from HR.

477

478 For this paper, AKC and RG led the analyses and first draft of manuscript working closely with AKS,  
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481 agree to be accountable for the work. All authors made contributions to the conception, design,  
482 data collection or analysis or interpretation of data.

483

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695

#### 696 **Figures**

697 Figure 1. Flow diagram for respectful maternal and newborn care in Pokhara Hospital, EN-BIRTH  
698 study (n=7,370)

699

#### 700 **Tables**

701 Table 1. Background characteristics of women, EN-BIRTH study (n=4296)

	<b>N</b>	<b>EN-BIRTH Proportion (95% CI)</b>
<b>Age (mean ± SD)</b>	4296	24.3 ±4.5
<b>Woman's age</b>		
<20 yrs	563	13.1 (12.1, 14.1)
20-29 yrs	3149	73.3 (72.0, 74.7)
≥30 yrs	584	13.6 (12.6, 14.6)
<b>Parity</b>		
No previous birth	619	14.4 (13.4, 15.5)
One previous birth	1924	44.8 (43.3, 46.3)
Two or more previous birth	1753	40.8 (39.4, 42.3)
<b>Ethnicity</b>		
Dalit	976	22.7 (21.5, 24.0)
Janjati	1039	24.2 (22.9, 25.5)
Madeshi	36	0.8 (0.6, 1.2)
Muslim	43	1.0 (0.7, 1.4)
Chettri/Brahmin	2065	48.1 (46.6, 49.5)
Other	137	3.2 (2.7, 3.7)
<b>Mode of birth</b>		
Vaginal birth (spontaneous, vacuum, forceps)	3694	86.0 (84.9, 87.0)
Caesarean birth	602	86.0 (84.9, 87.0)
<b>Sex of baby</b>		

	Male	2350	54.7 (53.2, 56.2)
	Female	1946	45.3 (43.8, 46.8)
<b>Birth weight (in grams)</b>			2920.7±482.8
<b>Low birth weight*</b>			
	No ≥2500g	3778	88.1 (87.1, 89.0)
	Yes <2500g	510	11.9 (11.0, 12.9)
<b>Gestational age (in weeks)</b>			
<b>Preterm birth*</b>			38.6±3.4
	No, ≥37 completed weeks gestation	3901	90.9 (90.1, 91.8)
	Yes, <37 completed weeks gestation	387	9.0 (8.2, 9.9)

702 EN-BIRTH participants (n=4,296) were a subset from the NePeriQIP study (n=6,929) and  
703 demographic characteristics for both are shown in Additional file 3.  
704 Ethnic groups with socio-economic advantages include: Chettri/Brahmin and other; disadvantaged  
705 ethnic groups include Dalit, Janjati, Madeshi, Muslim.  
706 \*Missing 8

Table 2. Coverage of respectful maternity care during childbirth, EN-BIRTH study (n=4,296)

Disrespect and abuse typology		Respectful Maternal and Newborn Care	Coverage (95% CI)
No Abuse	1 to 3	Woman or baby not abused (physically, verbally or sexually) during labour or childbirth or after birth (n-4296)	100%
No Stigma and discrimination	4.1	Woman and baby treated with respect and dignity (n-4296)	100.0%
	4.2	Health service met religious and cultural birthing practice needs (n-3252)	87.0% (85.9-88.0)
	4.3	Mother was satisfied with the privacy during her stay at the hospital (n-3622)	84.3% (81.9-86.7)
Meet standards	5.1	Baby kept in skin-to-skin contact with mother immediately after birth (n-803)	18.7% (17.6-19.9)
	5.3	Medical doctor examined the baby in presence of the mother (n-4292)	99.9%
Rapport between women and providers – Ineffective communication	6.1	Woman was satisfied with the health education and information received from health care providers (n-4296)	100.0%
	6.5	Woman were given the opportunity to discuss any concerns and preferences (n-4296)	100.0%
	6.7	Woman received written or verbal information and counselling on exclusive breastfeeding until 6 months before discharge (n-4296)	100.0%
	6.8	Woman received written or verbal information and counselling on nutrition and how to eat healthily (n-13)	0.3% (0.2-0.6)
Lack of Health system condition and constraint	7.1	Woman not refused care due to inability to pay (n-0)	0%



Table 3. Coverage of respectful maternity care by socio-economic characteristics, EN-BIRTH study (n=4296)

		<b>Health service met religious and cultural birthing practice needs</b>	<b>Woman was satisfied with privacy during her stay at the hospital</b>	<b>Baby kept in skin-to-skin contact with mother immediately after birth</b>
	n	<b>3252 (95% CI)</b>	<b>3622 (95% CI)</b>	<b>803 (95% CI)</b>
<b>Woman's age</b>				
<20 yrs	563	92.4 (89.9, 94.3)	88.1 (85.2, 90.5)	16.7 (13.8, 20.0)
20-29 yrs	3149	85.9 (84.6, 87.0)	82.9 (81.6, 84.2)	19.9 (18.6, 21.4)
≥30 yrs	584	88.5 (85.7, 90.9)	88.7 (85.9, 91.0)	14.2 (11.6, 17.3)
<b>Ethnicity</b>				
Advantaged	2094	88.6 (87.2, 89.9)	86.3 (84.8, 87.8)	17.2 (15.6, 18.9)
Disadvantaged	2202	85.6 (84.1, 87.0)	82.5 (80.9, 84.1)	20.2 (18.6, 21.9)
<b>Mode of birth</b>				
Vaginal birth (spontaneous, vacuum, forceps)	3694	85.2 (84.0, 86.3)	82.2 (80.9, 83.4)	21.7 (20.4, 23.1)
Caesarean birth	602	98.3% (96.9-99.1)	97.3% (92.2-100.0)	0.5% (0.2-1.5)
<b>Parity</b>				
No previous birth	619	94.5 (92.4, 96.1)	92.4 (90.0, 94.3)	9.9 (7.7, 12.5)
1 previous birth	1924	87.5 (85.9, 88.9)	83.0 (81.2, 84.6)	19.7 (18.0, 21.5)
2 or more previous birth	1753	84.0 (82.2, 85.7)	83.1 (81.3, 84.8)	20.8 (19.0, 22.8)
<b>Sex of baby</b>				
Male	2350	87.8 (86.4, 89.1)	85.1 (83.6, 86.5)	17.8 (16.3, 19.4)
Female	1946	86.2 (84.6, 87.7)	83.6 (81.8, 85.1)	19.8 (18.1, 21.7)

Ethnic groups with socio-economic advantages include: Chettri/Brahmin and other; disadvantaged ethnic groups include Dalit, Janjati, Madeshi, Muslim.

Table 4. Association between reporting of poor care with socio-demographic and obstetric characteristics, EN-BIRTH study (n=4296)

	Respectful care				Meeting standards of newborn care	
	Health service met religious and cultural birthing practice needs		Woman was satisfied with privacy during her stay at the hospital		Baby kept in skin-to-skin contact with mother immediately after birth	
	cOR, 95% CI	aOR, 95% CI	cOR, 95% CI	aOR, 95% CI	cOR, 95% CI	aOR, 95% CI
<b>Woman's Age</b>						
<20 yrs	1.99 (1.44, 2.76)	1.18 (0.80, 1.73)	1.53 (1.16, 2.00)	0.95 (0.68, 1.31)	1.24 (0.98, 1.58)	0.73 (0.54, 0.98)
20-29 yrs	Reference	Reference	Reference	Reference	Reference	Reference
≥30 yrs	1.27 (0.97, 1.67)	1.32 (0.99, 1.77)	1.62 (1.23, 2.12)	1.55 (1.16, 2.06)	1.50 (1.17, 1.93)	1.48 (1.14, 1.93)
<b>Ethnicity (caste)</b>						
Advantaged	Reference	Reference	Reference	Reference	Reference	Reference
Disadvantaged	1.31 (1.10, 1.57)	1.25 (1.04, 1.50)	1.34 (1.13, 1.58)	1.27 (1.07, 1.50)	1.22 (1.05, 1.43)	1.17 (1.00, 1.37)
<b>Mode of birth</b>						
Vaginal birth (spontaneous, vacuum, forceps)	Reference		Reference		Reference	
Caesarean birth	0.09 (0.05, 0.17)	0.09 (0.05, 0.17)	0.10 (0.06, 0.18)	0.11 (0.06, 0.19)	0.02 (0.01, 0.06)	0.02 (0.01, 0.06)
<b>Parity</b>						
No previous birth	2.46 (1.70, 3.57)	2.20 (1.45, 3.43)	2.50 (1.82, 3.45)	2.51 (1.74, 3.61)	2.24 (1.68, 2.99)	2.64 (1.89, 3.69)
1 previous birth	Reference	Reference	Reference	Reference	Reference	Reference
2 or more previous birth	0.75 (0.63, 0.91)	0.70 (0.57, 0.85)	1.01 (0.85, 1.20)	0.90 (0.74, 1.08)	0.933 (0.79, 1.10)	0.80 (0.67, 0.96)
<b>Sex of baby</b>						
Male	0.87 (0.73, 1.04)	0.85 (0.71, 1.02)	0.89 (0.76, 1.05)	0.90 (0.76, 1.06)	0.88 (0.75, 1.02)	0.88 (0.75, 1.03)
Female	Reference		Reference		Reference	

cOR= crude odds ratios; aOR= adjusted odds ratios;

Ethnic groups with socio-economic advantages include: Chettri/Brahmin and other; disadvantaged ethnic groups include Dalit, Janjati, Madeshi, Muslim.

Table 5. Predictors for reporting of non-respectful care\* during childbirth including multi-variate analysis, EN-BIRTH study (n=4296)

	Uni-variate linear regression				Multi-variate linear regression			
	$\beta$	SE	t-value	p-value	$\beta$	SE	t-value	p-value
<b>Global intercept</b>	-	-	-	-	0.014	0.08	0.171	0.864
<b>Woman's age</b>								
Intercept	-0.039	0.018	-2.211	0.027	0.33	0.049	6.794	
<20 yrs	0.173	0.046	3.785	<0.0001	0.022	0.055	0.395	0.693
20-29 yrs	<b>Reference</b>				<b>Reference</b>			
≥30 yrs	0.123	0.045	2.726	0.006	0.117	0.047	2.507	0.012
<b>Ethnicity</b>								
Intercept	-0.031	0.022	-1.412	0.158				
Dalit	0.061	0.039	1.562	0.118	0.051	0.039	1.326	0.185
Janjati	0.112	0.038	2.958	0.003	0.083	0.037	2.213	0.027
Madeshi	-0.369	0.168	-2.2	0.028	-0.344	0.165	-2.082	0.037
Muslim	0.244	0.154	1.591	0.112	0.229	0.152	1.512	0.131
Chettri/Brahmin	<b>Reference</b>				<b>Reference</b>			
Other	-0.29	0.088	-3.299	0.001	-0.287	0.087	-3.311	0.001
<b>Mode of birth</b>								
Intercept	0.366	0.04	9.066	<0.0001				
Vaginal birth (spontaneous, vacuum, forceps)	<b>Reference</b>				<b>Reference</b>			
<b>Caesarean birth</b>	<b>-0.425</b>	<b>0.043</b>	<b>-9.777</b>	<b>&lt;0.0001</b>	<b>-0.402</b>	<b>0.044</b>	<b>-9.228</b>	<b>&lt;0.0001</b>
<b>Parity</b>								
Intercept	-0.014	0.023	-0.626	0.532				
<b>No previous births</b>	<b>0.242</b>	<b>0.046</b>	<b>5.251</b>	<b>&lt;0.0001</b>	<b>0.228</b>	<b>0.053</b>	<b>4.321</b>	<b>&lt;0.0001</b>
1 previous birth	<b>Reference</b>				<b>Reference</b>			
2 or more previous births	-0.051	0.033	-1.536	0.125	-0.083	0.035	-2.402	0.016
<b>Sex</b>								
Intercept	0.02	0.021	0.993	0.321				
Male	-0.045	0.031	-1.476	0.14	-0.053	0.03	-1.742	0.082
Female	<b>Reference</b>				<b>Reference</b>			

\*Non-respectful care defined as the health service having not met religious and cultural birthing practice needs (n=3252), and that the woman was not satisfied with privacy during her stay at the hospital (n=3622)

Ethnic groups with socio-economic advantages include: Chettri/Brahmin and other; disadvantaged ethnic groups include Dalit, Janjati, Madeshi, Muslim.

$\beta$ = beta coefficient, SE= standard error

## ADDITIONAL FILES

<b>File Name</b>	<b>Format</b>	<b>Title</b>
Additional File 1	Doc	STROBE checklist
Additional File 2	Excel	Questionnaire for respectful maternity care and mapping according to typology, EN-BIRTH study
Additional File 3	Doc	Background characteristics of women enrolled in NePeriQIP and EN-BIRTH studies
Additional File 4	Doc	Mode of birth by ethnicity at Pokhara Hospital, Nepal, EN-BIRTH study
Additional File 5	Doc	Ethical approval of local institutional review boards, EN-BIRTH and NePeriQIP studies