The yearly financing need of providing paid maternity leave in the informal sector in Indonesia

Adiatma Siregar (adiatma.siregar@unpad.ac.id)
Center for Economics and Development Studies, Department of Economics, Faculty of Economics and Business, Universitas Padjadjaran https://orcid.org/0000-0003-0747-1596

Pipit Pitriyan
Universitas Padjadjaran Fakultas Ekonomi dan Bisnis

Donny Hardiawan
Universitas Padjadjaran Fakultas Ekonomi dan Bisnis

Paul Zambrano
Alive and Thrive, FHI 360, South East Asia

Mireya Vilar-Compte
Research Institute for Equitable Development

Graciela Ma Teruel Belismelis
Research Institute for Equitable Development

Meztli Moncada
Research Institute for Equitable Development

David Tamayo
Research Institute for Equitable Development

Grace Carroll
Yale University School of Public Health

Rafael Perez-Escamilla
Yale University School of Public Health

Roger Mathisen
Alive & Thrive, FHI 360, Southeast Asia

Research

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Adiatma Y.M Siregar [1], Center for Economics and Development Studies, Department of Economics, Faculty of Economics and Business, Universitas Padjadjaran, Jl. Hayam Wuruk 6 – 8, Bandung, West Java, Indonesia, 40115, adiatma.siregar@unpad.ac.id*

Pipit Pitriyan[1], Center for Economics and Development Studies, Department of Economics, Faculty of Economics and Business, Universitas Padjadjaran, Jl. Hayam Wuruk 6 – 8, Bandung, West Java, Indonesia, 40115, pipit.pitriyan@unpad.ac.id

Donny Hardiawan[1], Center for Economics and Development Studies, Department of Economics, Faculty of Economics and Business, Universitas Padjadjaran, Jl. Hayam Wuruk 6 – 8, Bandung, West Java, Indonesia, 40115, donnyhardiawan@gmail.com

Paul Zambrano[2], Alive & Thrive, FHI 360, Southeast Asia, 7F, Opera Business Center, 60 Ly Thai To Street, Hanoi, Vietnam, PZambrano@fhi360.org

Mireya Vilar-Compte[3], Research Institute for Equitable Development (EQUIDE), Mexico City, Mexico, mireya.vilar-compte@yale.edu

Graciela Ma Teruel Belismelis[3], Research Institute for Equitable Development (EQUIDE), Mexico City, Mexico, chele.teruel@ibero.mx

Meztli Moncada[3], Research Institute for Equitable Development (EQUIDE), Mexico City, Mexico, meztli.moncada@gmail.com

David Tamayo[3], Research Institute for Equitable Development (EQUIDE), Mexico City, Mexico, david_aban@hotmail.com

Grace Carroll[4], Yale School of Public Health, New Haven, Connecticut, United States, grace.j.carroll@yale.edu

Rafael Perez-Escamilla[4], Yale School of Public Health, New Haven, Connecticut, United States, rafael.perez-escamilla@yale.edu

Roger Mathisen[2], Alive & Thrive, FHI 360, Southeast Asia, 7F, Opera Business Center, 60 Ly Thai To Street, Hanoi, Vietnam, RMathisen@fhi360.org

*Corresponding author

Abstract

Background

The economic cost of not breastfeeding in Indonesia is estimated at US$1.5–9.4 billion annually, the highest in South East Asia. Half of the 33.6 million working women of reproductive age (WRA) in Indonesia (15-49 years) are informal employees, meaning they are working as casual workers or they are self-employed (small scale business) and assisted by unpaid/family worker(s). No specific maternity protection entitlements are currently available for WRA working informally in Indonesia. This study aims to estimate the financing need of providing maternity leave cash transfer (MCT) for WRA working in the informal sector in Indonesia.

Method

The costing methodology used is the adapted version of the World Bank methodology by Vilar-Compte *et al*, following pre-set steps to estimate costs using national secondary data. We used the 2018 Indonesian National Socio-Economic Survey to estimate the number of women working informally who gave birth within the last year. The population covered, potential cash transfer's unitary cost, the incremental coverage of the policy in terms of time and coverage, and the administrative costs were used to estimate the cost of MCT for the informal sector.

Result

At 100% coverage for 13 weeks of leave, the yearly financing need of MCT ranged from US$175million (US$152/woman) to US$669million (US$583/woman). The share of the yearly financing need did not exceed 0.5% of Indonesian Gross Domestic Product (GDP).

Conclusion

The yearly financing need of providing MCT for eligible WRA working in the informal sector is economically attractive as it amounts to less than 0.5% of GDP nominal of Indonesia. While such a program would be perceived as a marked increase from current public health spending at the onset, such an investment could substantially contribute to the success of breastfeeding and substantial corresponding public health savings given that more than half of working Indonesian WRA are employed in the informal sector. Such policies should be further explored while taking into consideration realistic budget constraints and implementation capacity.

Keywords: Informal sector, breastfeeding, maternity protection, maternity leave, costing, maternity cash transfer, Indonesia

85 **Background**

86 Exclusive breastfeeding (EBF) is defined as the proportion of infants 0 – 5 months of age who
87 received only breastmilk [1]. Around half of all Indonesian children under six months were not
88 exclusively breastfed in 2017 [2]. While this figure meets the Global Nutrition Target of 50% EBF by
89 2025 [3], much is required to maintain and/or increase this proportion. The economic cost of not
90 breastfeeding in Indonesia is estimated to be as high as US$1.5 – 9.4 billion annually, the highest in
91 South East Asia [4–6]. The costs of not breastfeeding estimates include costs of treating diarrhea,
92 respiratory disease, ovarian cancer, type 2 diabetes, income loss due lower cognitive development, and
93 current and future mortality.

94

95 Maternity protection policies that include paid maternity leave are crucial to ensure the health of
96 mothers and children and that women meet their breastfeeding goals [7–12]. Maternity protection
97 allows mothers to be economically active while ensuring the safety and success of their pregnancy,
98 and caregiving of their children, including breastfeeding [13]. Maternity leave itself is associated with
99 higher rates of breastfeeding in low- and middle-income countries, and provide broad social,
100 developmental, and health benefits for working mothers and newborns, as well as promote gender
101 equity. Such benefits include alleviating the costs of sickness, cognitive losses and deaths due to not
102 breastfeeding [4–6,14]. Providing paid maternity leave entitlement for working women may also be
103 useful to improve maternal-child physical and mental health and family wellbeing, and also to
104 potentially increase women's participation in the labour market [8,11,12,15,16]. Studies have indeed
105 shown that paid maternity leave may improve breastfeeding outcomes; mothers receiving paid leave
106 for more time, breastfeed longer [9,11,17–20]. Although the empirical evidence on the impact of
107 maternity cash transfer (MCT) on breastfeeding outcomes is still limited, there are strong reasons to
108 expect that maternity benefits, including MCTs, are needed to improve breastfeeding among women

109 employed in the informal economy. Specifically, UNICEF's cash transfer conceptual framework
110 posits that social cash transfers can lead to higher EBF rates as the mother would be empowered to
111 have more time for childcare [21]. Indeed, UNICEF reports qualitative evidence showing that
112 maternity benefits can empower caregivers to spend more time raising their children [22].
113
114 About half of women in Indonesia are in the workforce [23], thus it is crucial to develop policies to
115 ensure that employed mothers are able to provide essential nurturing care both at home and while the
116 caregiver works in the first six months of a child's life without sacrificing both income and
117 employment opportunities. Some 48% of approximately 70 million women of reproductive age
118 (WRA) in Indonesia are in the labor force. Among this population, 52% are informal employees [24].
119 According to the National Labor Survey (SAKERNAS) Interviewer Guide, women can be classified
120 as working in the informal sector if they are working as casual workers or if they are self-employed
121 (small-scale business) and assisted by unpaid/family worker(s) [25].
122
123 Currently, maternity protection entitlements are not available for WRA working informally in
124 Indonesia and only available for WRA working in the formal sector, calling for a reform in the current
125 policies supporting breastfeeding [26]. However, efforts to scale-up breastfeeding support for women
126 working in the informal sector in Indonesia have been, to some extent, covered by the existing social
127 protection program called Family Hope Program (*Program Keluarga Harapan*/PKH) scheme [27,28].
128 This conditional cash transfer program provides a flat-rate cash transfer for the 20% poorest families
129 with students, pregnant women or disabled family members. For a pregnant woman to participate in
130 the program she must attend four antenatal checkups and consume iron tablets during her pregnancy,
131 be assisted by a trained professional birth attendant during delivery, and have two post-natal care visits
132 [29]. These measures may indirectly contribute to improving breastfeeding.

133

134 Previous studies in Indonesia have shown that the annual cost of not breastfeeding is large, ranging
135 from 0.14% to 0.90% of Indonesia's GDP in 2018 [4–6] and outweighs the financing need of paid
136 maternity leave within the formal sector [30]. As women in low and middle income countries
137 (including Indonesia) are more likely to work in the informal sector [31] and mostly are uncovered by
138 maternity leave policies [32], paid maternity leave policies within the informal sector would potentially
139 result in larger benefits both economically and non-economically than within the formal sector.
140 Unfortunately, providing paid maternity leave to informal workers is still a challenge globally [32]. In
141 Indonesia, the International Labour Organization (ILO) coverage classification put the country in the
142 10 to 32% range [7], showing that the coverage even in the formal sector is not yet optimal. One of
143 the disincentives of providing paid maternity leave is perceived or actual financial cost by employers
144 [30,33]. Another issue is that the cost of supporting a maternity benefit for WRA working informally
145 likely needs to be covered entirely by the government. Therefore, it is imperative to estimate the annual
146 cost of providing maternity protection entitlements within the informal sector for advocacy purposes
147 to create the will among decisionmakers to develop policies and programs to provide maternity
148 benefits to women employed in the informal sector [34,35]. Investing in maternity protection for
149 mothers working informally is a form of social justice that creates better conditions for women to
150 exercise their choice and may protect their right to breastfeed [36,37].

151

152 This study aims to estimate the financing need of providing a maternity leave cash transfer (MCT) for
153 WRA who work informally in Indonesia. Such studies are lacking in Indonesia and in other low- and
154 middle-income countries all over the globe [31,38]. Furthermore, the few studies available have
155 analyzed cash transfers targeting several outcomes (e.g. education and health) and not specifically paid
156 maternity leave, in spite that some of these studies have shown that cash transfer may have positive

157 impact on breastfeeding outcomes [39–44]. This study is the first to provide such estimates for
158 Indonesia, and as such can provide urgently needed evidence for policy making purposes in the
159 context of supporting recommended breastfeeding practices, especially given the relatively low health
160 budget in Indonesia (under 5% share of GDP as of 2014) [45]. This study follows on our previous
161 research on the financing need to expand maternity protection for the formal sector [30] and begins
162 to fill the gap in such estimates for informal sector maternity benefits.
163

164 **Methods**

165 The costing methodology used is the adapted version of the World Bank methodology by Vilar-
166 Compte *et al* [31], following pre-set steps to estimate costs using nationally secondary data. The
167 following formula was used in the study:

168 $$MCT_y = ((\alpha * Pop_y) * UC_{CT} * IC_y) + AdmC_y$$

169 Where:

170 MCT_y : the MCT annual cost for a given year of intervention

171 α : probability of WRA giving birth in year *y*

172 α x Pop_y : population of women of reproductive ages (i.e. 18 – 49 years of age) in year *y* weighted
173 by α

174 UC_{CT} : unit cost of the CT

175 IC_y : incremental coverage (IC) of MCT assumed for a year *y*

176 $AdmC_y$: administration cost in year *y*
177

178 We used the 2018 Indonesian National Socio-Economic Survey (SUSENAS) [24], an annual nationally
179 representative survey able to provide population level estimates using provided weights. SUSENAS is
180 the largest socioeconomic survey, typically comprising nationally representative samples of 200,000

181 households. SUSENAS includes general information and personal characteristics of respondents, as
182 well as the variables used to determine fertility and the type of labor (i.e. formal vs. informal). In line
183 with our study, SUSENAS enables us to estimate the number of women working informally who gave
184 birth within the last year.
185
186 To calculate the costs in this study, the previous formula was applied through the following steps:

187 • *Step 1:* We computed the number of women who work informally and gave birth in the prior year,
188 given a vector of individual characteristics (we provided more detailed explanation of the
189 definition of informal sector as well as rural/urban in Additional File 1). Instead of an overall
190 population estimate, it is recommended to separate the population in subgroups with different
191 fecundity and participation in the informal sector to obtain a more accurate estimate of the target
192 population for a given year. We separated the number of WRA working in the informal sector
193 into several subgroups, namely age (15 – 19, 20 – 24, 25 – 29, 30 – 34, 35 – 39, 40 – 44, 45 – 49),
194 education (no education, primary education, junior high school, senior high school, diploma, and
195 university), marital status (single, married, divorced, widow), locality (urban, rural), and gave birth
196 in the last one year, resulting in 308 subgroups (e.g. an example of a subgroup: the number of
197 women working informally, aged 15 – 19, no education, single, live in urban area, gave birth in
198 the last one year). SUSENAS provides data on giving birth within the last two years, thus we
199 divided the number by two for each of the subgroups to reflect the number of WRA who gave
200 birth within the last one year.

201 • *Step 2:* We then calculated the percentage of WRA working informally who gave birth in the prior
202 year per subgroup as a share of the total WRA working informally (i.e. the number of WRA
203 working informally who gave birth in the last one year in a subgroup/the total number of WRA
204 working informally) to estimate α. For each subgroup, α was defined as the probability of WRA

205 working informally who gave birth in the last year within each of the subgroup, resulting in 308
206 different values for α.

207 • *Step 3:* We determined a realistic estimate of beneficiaries who may claim maternity leave in the
208 informal sector in a given year by weighting the population of WRA employed in the informal
209 sector by α (i.e. probability of having a child in a given year). Pop_y or WRA data at the population
210 level were obtained from World Bank estimate [46], adjusted by the percentage of female labor
211 participation rate and adjusted further by WRA who work informally using SUSENAS data [24].
212 Pop_y was then multiplied by α of the respective subgroups to determine the number of WRA who
213 work informally and gave birth within the prior year $(\alpha * Pop_y)$.

214 • *Step 4:* The unit cost data (UC) was proxied by, first, minimum wage data (average minimum wage
215 derived from various documents at the provincial level depicting respective minimum wage);
216 second, unit cost of a cash transfer program called Family Hope Program (PKH) [47,48]; and
217 third, the poverty line (derived from World Bank report) [49]. UC was multiplied by results from
218 step 3: $(\alpha * Pop_y) * UC_{CT}$.

219 • *Step 5:* Incremental coverage (IC) was determined based on regulations, recommendations, and
220 literature regarding the length of leave and coverage. The length of leave used in this study started
221 from the application of the current Indonesian law of 13 weeks maternity leave (approximately 3
222 months leave) [26], and increased to 14 (minimum requirement of ILO) [50], 18 (extension
223 according to ILO) [51], and 26 weeks (WHO recommendation) [3]. We also used two coverage
224 scenarios of WRA working informally eligible for maternity leave, namely 21% (a midrange value
225 from the ILO coverage classification placing Indonesia in the 10 to 32% level) [7] and 100%.
226 These were then multiplied by step 4: $(\alpha * Pop_y) * UC_{CT} * IC$.

227 • *Step 6:* As this type of cash transfer (CT) would be new, the administrative cost needs to be added.
228 Administrative cost ($AdmC_y$) was derived based on a previous study of the national Family Hope
229 Program (PKH), managed by The Ministry of Social Affairs. The program provides the lowest
230 20% income household group with conditional cash transfers (CCT) to increase its family
231 members' access to health and education facilities. We believe this program approximates the
232 context simulated in our MCT study for WRA working informally. The simulation approach was
233 needed since no actual MCT programs for women working informally exist. The administration
234 cost of PKH is deemed moderate and the program has a better administrative and management
235 structure compared to other CCT programs in Indonesia. The share of PKH administrative cost
236 (14% in 2009) is closer to other mature CCT programs in other countries (around 8%) [29,52–
237 56]. In monetary terms, the average administrative costs per household beneficiaries in 2010 was
238 about US$24 [29]. We converted this value into 2018 value using Consumer Price Index obtained
239 from World Bank data [57] resulting in a fixed cost of US$35 per person. To calculate the total
240 administrative cost, the fixed cost per person was multiplied by $(\alpha * Pop_y)$: $US\$35 * (\alpha *$
241 $Pop_y) = AdmC_y$. Using this cost, the percent of our administrative cost as compared to the total
242 cost falls between 5 – 36% (Table 3), depending on the UC used in the calculation. Our
243 administrative cost per woman and its share out of the total cost is higher than that of Mexico,
244 but comparable to the study conducted in the Philippines [31,58].
245
246 The administrative cost ($AdmC_y$) was added to the total cost obtained from step 5 to yield the total
247 cost of providing cash transfers to WRA working informally. The cost per women was calculated by
248 dividing the total cost by the estimated number of women expected to receive maternity leave. The
249 details of the assumptions used for our calculations are provided in Table 1. All costs were converted
250 to USD using the 2019 reference exchange rate from Bank of Indonesia [59].

251

252 **Results**

253 Table 2 presents the characteristics of WRA in Indonesia who work informally and gave birth, using
254 SUSENAS data. As many as 71.1 million females were categorized as WRA, and of this amount
255 50.17% were working, and among those, 59.11% were working informally. Of WRA working
256 informally, 5.43% gave birth within the last one year. Based on the calculation of coverage (21% and
257 100%, table 1) multiplied by the number of informally working women, there are 240,913 (21%
258 coverage) and 1,147,204 (100% coverage) women who would be potentially eligible to receive the
259 MCT program.

260

261 *The annual financing need for MCT in informal sector*

262 Table 3 provides the cost calculation based on the formula presented in the methods section using the
263 different unit costs, at 21% and 100% coverage. The table showing the costs per province is presented
264 in Appendix A. Understandably, the highest total costs are associated with the total cost based on the
265 minimum wage and the unit cost of MCT per month, the greatest unit cost. The administrative cost
266 (similar for all three UCs) was added to each of the four different UCs to estimate the total cost of
267 MCT for eligible informally working WRA. At 100% coverage, the total cost calculated by using
268 minimum wage, 2/3 minimum wage, PKH cash transfer, and poverty line as the UC for 13 weeks
269 amounted to around US$634million (US$553/woman), US$436million (US$380/woman),
270 US$669million (US$583/woman), and US$175million (US$152/woman), respectively. The
271 comparison between UC for respective coverage (100% or 21%) is only differentiated by the UC as
272 the other variables are constant, including the administration cost. The costs at 21% coverage for any
273 length of maternity leave are 5 times lower than the estimates at 100% coverage. Although the cost

274 per woman could be about 11 times higher than the health expenditure per capita in Indonesia in 2014
275 (adjusted to 2018 value), the estimate did not exceed 0.5% of 2018 nominal GDP [45,57,60].
276
277 **Discussion**
278 This study estimates the annual financing need of providing an MCT in the informal sector. The
279 annual financing need of providing an MCT for all WRA working informally ranges from US$175
280 million (US$152/woman) to US$1.3 billion (US$1,131/woman) depending on the UC applied. At
281 100% coverage, the total financing need of providing MCT for WRA working informally is much
282 higher than the existing CT program (PKH). As previously described, the PKH program provides the
283 lowest 20% income household group with conditional cash transfers (CCT) to increase its family
284 members' access to health and education facilities, to improve the maternal and child health, and it is
285 the closest type of existing CT program in Indonesia to our proposed MCT program. The annual cost
286 of PKH adjusted to 2018 value is US$209million, covering 778,000 households in 2010 [29,57]. At
287 100% coverage, our MCT program total cost using CT as UC (for 13 weeks leave) amounts to around
288 US$669million and US$1.3 billion (26 weeks leave). Using other UCs, except for the poverty line at
289 13 and 14 weeks, all total costs at 100% coverage are higher than PKH. At the lower coverage rate of
290 21% the cost is much lower (US$140million for 13 weeks leave, using CT as UC), similar to the other
291 total costs estimated by using other UCs at 21% coverage. As such, a trade off occurs between
292 increasing coverage or producing a more feasible total expenditure.
293
294 The PKH is an established program producing positive results (e.g. increase utilization of childbirth
295 through trained health professionals, stunting reduction) [28]. The introduction of MCT in the
296 informal sector may require significant advocacy to convince policy makers of the importance of the
297 transfer program to implement at 100% coverage for 26 weeks. Given budget constraints can be one

298 of the obstacles for implementing maternity protection policies [30,45], the initial introduction of
299 MCT for the informal sector could start at a lower cash transfer benefit level and/or coverage (i.e. 13
300 weeks and/or 21% coverage), using a more moderate UC (i.e. poverty line or 2/3 minimum wage),
301 and increase time/benefit provided, coverage, and UC gradually as implementation progresses.
302 However, further studies are also required to determine the minimum cash transfer amount needed
303 to improve health outcomes and related behaviors such as breastfeeding. As PKH has already yielded
304 positive results, the PKH cash transfer unit cost can be considered as a tentative benchmark of the
305 required minimum cash transfer amount.
306
307 We also found that our total financing need estimates in all scenarios did not exceed 0.5% of Indonesia
308 nominal GDP in 2018, a much lower percentage than the share of health expenditure on GDP. The
309 cost per woman, however, could be around 11 times higher than the health expenditure per capita
310 [45] and 8 times higher than the cost of PKH per household [29]. Thus, although the financing need
311 seems low in comparison to the total GDP, the cost per woman may not look appealing to policy
312 makers. This can be challenging since budget availability has already been recognized as one of the
313 issues faced in optimizing the more established paid maternity leave policy for the formal sector [30].
314 As MCT policies for informal workers currently do not exist, this challenge will require proper
315 program and financial planning as well as support from the government and relevant stakeholders
316 since even now the local government struggles with allocating its budget to support the policy for the
317 formal sector, let alone the informal sector. Additionally, even though the policies regulating maternity
318 leave are available for the formal sector, its implementation is still not optimal [61–63]. This may prove
319 to be a challenge for the informal sector to develop and implement MCT policy. If such policies are
320 to be implemented, it should ensure that women are able to access MCT without facing the risk of
321 discrimination due to the policy implementation [64,65].

322

323 One aspect that should be advocated to policy makers if MCT policies are to be optimally
324 implemented for both formal and informal sectors is that the cost of not breastfeeding is much higher
325 than the financing need of implementing MCT policy. The cost of not breastfeeding in Indonesia
326 includes the irreversible costs due to sickness and cognitive loss which may be higher than US$1.5-9.4
327 billion annually, as well as the high annual level of maternal and infant deaths which may reach more
328 than 7,000 deaths [4–6]. These negative impacts of not breastfeeding should be a primary
329 consideration in developing sound MCT policies for both the formal and informal sectors. Indeed
330 paid parental leave has been shown to support meeting the Sustainable Development Goals (SDGs)
331 outcomes such as lower infant mortality, increased exclusive breastfeeding rate, and better economic
332 outcomes for women [12]. The total financing need of both our estimate for informal sector, and the
333 other estimate from previous study on formal sector [30] shows that the combined financing need of
334 providing MCT to eligible WRA in both the formal and informal sectors at 100% coverage based on
335 minimum wage amount to be around US$2 billion per year, roughly 4.5 times lower than the estimate
336 of the cost of not breastfeeding in Indonesia. This indicates the value of investing in MCT, in addition
337 to its benefits in terms of alleviating the costs of sickness, cognitive losses and deaths due to not
338 breastfeeding and improve maternal-child physical and mental health and family wellbeing, and also
339 to potentially increase women's participation in the labour market [4–6,8,11,12,14–16,66]. However,
340 the proposed MCT approach would require, among other things, sound monitoring to ensure that
341 breastfeeding actually took place, consistency in the best timing of delivery of cash distribution and
342 breastfeeding counselling visits, recognizing that many mothers receiving the cash transfer face major
343 social determinants of health challenges. These need to be addressed through supportive social
344 protection, efficacy evaluation of the intervention, and economic policies [41,42,67–69]. In addition,
345 it should also be stressed that there is evidence showing that maternity leave schemes have other

346 benefits beyond in addition to breastfeeding such as a larger share of women returning to work [70],
347 improved mothers' mental health [66], and lower neonatal mortality [71]. While these additional
348 benefits have been reported in formal maternity leave schemes, they will need to be considered when
349 evaluating the efficacy and social return of MCT.
350
351 As most working WRA in Indonesia are working in the informal sector, providing MCT to this group
352 may reduce the cost of not breastfeeding in Indonesia by a large number. Other barriers to providing
353 effective maternity protection policies such as strong breastmilk substitutes marketing, government
354 budget constraints, perceived or actual financial cost by employers (thus reducing their profits),
355 absenteeism, lack of information on and support for maternity protection, lack of workplace lactation
356 rooms, socio-cultural factors (e.g. the need to introduce complementary food early) [9,30,33] should
357 also be addressed adequately to ensure the success of any maternity protection policies [35].
358
359 This study has a few limitations that need to be addressed through further research to reduce the
360 uncertainties around our costing estimates. First, using PKH cash transfer UC is not a perfect
361 comparison for assessing the idea of providing maternity leave CT to informally working WRA. PKH
362 is targeted at the families in the 20% lowest income bracket, with, among others, pregnant women as
363 a family member. However, this was our only modeling option as currently this is the only cash transfer
364 program that targets family with pregnant women to promote maternal health for the poor. In
365 addition, we used alternative operationalizations of UC to anticipate for costs differences. Second, our
366 study draws on national level data which may not accurately represent unique local characteristics.
367 This is quite important since regions across the Indonesian archipelago have diverse characteristics
368 which may result in different estimates of costs for maternity protection policies (e.g. higher MCT due
369 to the need to pay for a more expensive transport mode to reach a health facility). Thus, future studies

370 may explore sub-national costs and breastfeeding practices and develop a more locally representative
371 result as a basis for a local maternity protection policy. Also, since our study only focuses on Indonesia,
372 a comparative study with other countries with roughly similar settings would be useful for comparison
373 to develop a more comprehensive cost analysis. Third, the administrative costs are a rough estimate
374 that may have biases. As more countries implement such maternity leave CT, better estimations should
375 be available in the future. Last, although studies have shown the positive impact of paid maternity
376 leave in the formal sector, including improved breastfeeding outcome; more research is needed to
377 confirm the effectiveness of MCT on improving breastfeeding. Prospective studies are urgently
378 needed in this area.
379
380 **Conclusion**
381 The yearly financing need of providing MCT for eligible WRA working in the informal sector is
382 significantly lower than the current annual cost of not breastfeeding in Indonesia, as computed in
383 previous work [4-6]. While this program would represent a marked increase in current public health
384 spending at the onset, the total financing need estimates in all scenarios are less than 0.5% of the
385 country's 2018 nominal GDP. More than half of working Indonesian WRA are employed in the
386 informal sector, thus an MCT program targeting this sector could have substantial impact on
387 breastfeeding rates in the country. These policies have the potential to contribute to the success of
388 breastfeeding and as a result help avoid some infant and mother deaths and improve health, social,
389 and economic sectors. However, challenges such as budget constraints and less than optimal policy
390 implementation must be addressed to devise an effective and realistic strategy for MCT
391 implementation and enforcement based on sound implementation science methods [72].
392
393

394 **Abbreviations**

395 WRA: women of reproductive age; MCT: maternity leave cash transfer; GDP: Gross Domestic
396 Product; EBF: Exclusive breastfeeding; PKH: *Program Keluarga Harapan*/Family Hope Program; ILO:
397 International Labour Organization; UC: unit cost; IC: incremental Coverage; SUSENAS: *Survey Sosial*
398 *Ekonomi Nasional*/National Socio-Economic Survey; CCT: conditional cash transfers; SDGs:
399 Sustainable Development Goals

400

401 **Declarations**

402 **Ethics approval and consent to participate**

403 Not applicable as we analyzed secondary data. The corresponding author's institution owns the set of
404 SUSENAS data used in this study, while other secondary data as referenced is available publicly.

405

406 **Consent for publication**

407 Not applicable

408

409 **Availability of data and materials**

410 The SUSENAS data are available from Statistics Indonesia (BPS) repositories by request. All
411 calculation data generated or analyzed during the current study are available from the
412 corresponding author on reasonable request.

413

414 **Competing interests**

415 The authors declare that they have no competing interests.

416

417

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Authors' contributions

AYMS examined data analysis result, led and finalized the writing process. PP and DH provided data analysis as well contributed to the writing of the manuscript. MVC, GTB, MM, DT, GC, and RPE developed the methodology and contributed to the writing. PZ, RPE, and RM provided critical intellectual feedback to help revise the manuscript and contributed to the writing. All authors have read and approved the final manuscript.

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634 **Tables**

635

636 **Table 1. Assumptions and values used in the analysis**

Items	Value used in base scenario	Sources
Exchange rate (2019)	Rp 14,236/US$	Bank of Indonesia [59]
Rate of cash benefit provided to employees by employers (%)	100	ILO [7]
Minimum wage per month (US$)*	159.20 (39.80/week)	
2/3 of minimum wage per month (US$)*	106.13 (26.53/week)	
Family Hope cash transfer per month [47,48]	168.59 (42.15/week)	
Poverty line per month (3.2US$ PPP 2011 per day, converted into 2018 nominal value using PPP conversion of Rp5,341.5/US$ and 2019 exchange rate)	36.02 (9.01/week)	The World Bank [49], Ministry of National Development Planning of Republic of Indonesia [73]
Number of WRA (15 – 49 years)	71,182,875	The World Bank [46]
Percentage of working WRA (%)	50.17	National Bureau of Statistics Indonesia [24]
Percentage of women working in informal sector (out of working WRA) (%)	59.11	National Bureau of Statistics Indonesia [24]
Potential coverage of women working in informal sector potentially eligible to receive paid maternity leave (%)	21[a] and 100	ILO [7]
Length of maternity leave (weeks)	13, 14, 18 and 26	Ministry of Manpower and Transmigration of Republic of Indonesia [26], WHO [3]
Administration cost per female covered (US$)**	35 (2018)	The World Bank [29]
Indonesian GDP nominal 2018 (US$)	1,042,173,300,000	The World Bank [60]

637 *The wage reflects average provincial minimum wage, compiled from various provincial regulation documents; **assumed to be similar
638 to the Family Hope Program [29], adjusted to 2018 value using CPI of 147% (2010=100) [57]; [a]Mean of coverage in law of maternity
639 leave [7].
640 This table shows all of the assumptions and values used in the calculation

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643 **Table 2. Characteristics of informally working WRA in Indonesia**

Variables	Categories	Work informally (%)*	Gave birth within the last year (%)*
Age group (years)	15-19	53.0	3.8
	20-24	37.9	9.9
	25-29	47.4	12.0
	30-34	57.4	9.1
	35-39	63.8	5.9
	40-44	68.0	2.3
	45-49	70.2	0.6
Education level	No education, kindergarten or incomplete elementary school	83.1	5.1
	Elementary school	79.1	4.4
	Junior high school	70.6	5.6
	Senior high school	51.1	6.4
	Vocational school	19.6	8.0
	University	12.5	8.7
Marital status	Single	32.8	0.0
	Married	64.8	6.4
	Divorced	52.0	2.8
	Widowed	68.4	1.5
Type of locality	Urban	41.8	5.2
	Rural	72.4	5.6

644 Source: SUSENAS 2018 [24], *out of working WRA

645 This table shows the characteristics of WRA working informally using the SUSENAS data.

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654 **Table 3. The yearly financing need of MCT in informal sector**

Type of UC/% and length of coverage (weeks)	Number of WRA working informally covered	Cost of MCT (US$)	Administrative cost (US$)	Total cost (US$)	% of GDP 2018 (nominal)	Cost per woman (US$)
100% coverage						
Minimum wage						
13	1,147,204	593,551,960	40,390,767	633,942,726	0.061	553
14	1,147,204	639,209,803	40,390,767	679,600,569	0.065	592
18	1,147,204	821,841,175	40,390,767	862,231,942	0.083	752
26	1,147,204	1,187,103,919	40,390,767	1,227,494,686	0.118	1,070
2/3 minimum wage						
13	1,147,204	395,701,306	40,390,767	436,092,073	0.042	380
14	1,147,204	426,139,868	40,390,767	466,092,073	0.045	407
18	1,147,204	547,894,116	40,390,767	588,284,883	0.056	513
26	1,147,204	791,402,613	40,390,767	831,793,380	0.080	725
PKH Cash transfer	1,147,204	628,560,907	40,390,767	668,951,674	0.064	583
13	1,147,204	676,911,746	40,390,767	717,302,513	0.069	625
14	1,147,204	870,315,102	40,390,767	910,705,869	0.087	794
18	1,147,204	1,257,121,814	40,390,767	1,297,512,581	0.125	1,131
26						
Poverty line						
13	1,147,204	134,298,323	40,390,767	174,689,090	0.017	152
14	1,147,204	144,628,964	40,390,767	185,019,731	0.018	161
18	1,147,204	185,951,525	40,390,767	226,342,292	0.022	197
26	1,147,204	268,596,647	40,390,767	308,987,414	0.030	269
21% coverage						
Minimum wage						
13	240,913	124,645,912	8,482,061	133,127,973	0.013	553
14	240,913	134,234,059	8,482,061	142,716,120	0.014	592
18	240,913	172,586,647	8,482,061	181,068,708	0.017	752
26	240,913	249,291,823	8,482,061	257,773,884	0.025	1,070
2/3 minimum wage						
13	240,913	83,097,274	8,482,061	91,579,335	0.009	380
14	240,913	89,489,372	8,482,061	97,971,433	0.009	407
18	240,913	115,057,764	8,482,061	123,539,826	0.012	513
26	240,913	166,194,549	8,482,061	174,676,610	0.017	725
PKH Cash transfer	240,913	131,997,790	8,482,061	140,479,852	0.013	583
13	240,913	142,151,467	8,482,061	150,633,528	0.014	625
14	240,913	182,766,171	8,482,061	191,248,233	0.018	794
18	240,913	263,995,581	8,482,061	272,477,642	0.026	1,131
26						
Poverty line						
13	240,913	28,202,648	8,482,061	36,684,709	0.004	152
14	240,913	30,372,082	8,482,061	38,854,143	0.004	161
18	240,913	39,049,820	8,482,061	47,531,881	0.005	197
26	240,913	56,405,296	8,482,061	64,887,357	0.006	269

655 This table shows the costs calculation of financing MCT in informal sector per year

656 **Additional files**

657 **Additional file 1. Definition of informal sector and rural/urban**

658 This description shows the definition of informal sector as well as the definition of rural/urban used

659 in this study.

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Additionalfile1.docx