

1 Article

2 Self-Perceived Health Among Migrants Seen in 3 Médecins du Monde Free Clinics in Europe: Impact of 4 Length of Stay and Wealth of Country of Origin on 5 Migrants' Health

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14 **Abstract:** Health of migrant is a widely studied topic. It has been argued that migrant health may
15 deteriorate over time. Though migrants are 'a hard to reach' population in survey data, this paper
16 builds on a unique dataset provided by Médecins du Monde from five countries. We study self
17 perceived health (SPH) in connection with socio-economic and demographic factors and length of
18 stay. Results show different results for men and women. Asylum seekers compared to other
19 documented migrants have a worse health. Migrants with better living conditions tend to be in
20 better health. Employment and stable accommodation has a positive effect on SPH. Women from
21 poorer countries have a better physical SPH after 3 months of residing in the host country. This
22 paper contributes widely to knowledge of health of migrants. Contrarily to other evidence, health
23 of migrants tends to improve for some migrants.

24 **Keywords:** migrant health; length of stay; Médecins du Monde; self-perceived health; migration;
25 Human Development Index

27 1. Introduction

28 The health of migrant populations is an emerging trend in public health research which has
29 produced mixed results [1–3]. Inconsistent evidence shows that migrants can be either in better or
30 worse health than the population of their host country [4–11]. Many factors can contribute to these
31 inconsistent results, such as the host country itself (migrants in North America and southern Europe
32 are in better health than migrants in northern Europe [12]), migrants' social integration in the host
33 country (migrants living in host countries where they are more easily integrated tend to be in better
34 health [7]) or their length of residence (migrants' health worsens over time [4]). On average,
35 migrants tend to live in worse conditions than their host populations [13]. In Europe, the health of
36 migrants who have settled during recent years may be worse than those of migrants who arrived
37 during the 1970s, when labour migration was more common, the labour market was more in
38 demand and borders were more open [13].

39 Many researchers have explained the better health status of recent migrants in terms of a
40 "healthy migrant effect". According to this hypothesis, self-selection and migration policy result in
41 only the healthiest candidates having privileged access to emigration. Compared to the population
42 of industrialized countries, migrants from developing countries may also have healthier lifestyle

43 habits (eating behaviours, smoking, physical activity, etc.). However, after a certain period of time in
44 the host country, cultural integration, difficult employment and living conditions, lower social
45 status, and the weakening of social and familial links may have a negative impact on their health
46 [14,15]. Access to healthcare is also more of a challenge for migrants than nationals for many reasons:
47 lower healthcare literacy, reduced ability to assert their rights, discrimination in healthcare services
48 [16]. More recently, in light of the differences in migrants' health according to their country of origin,
49 some authors have argued that migration from a society in an earlier phase of the health transition to
50 a society in a more advanced phase has a positive effect on migrants' health [3].

51 In this article, we discuss whether length of stay and the wealth of the country of origin have an
52 impact on health. In order to do so, we have analysed data collected by Doctors of the
53 World/*Médecins du Monde* from free clinics in 5 countries to estimate the respective effects of the
54 wealth of the country of origin and the length of residence in the host country on the perceived
55 health of adult migrants (separately for men and women), while taking into account various living
56 conditions in the host country. Migrants from wealthier countries are expected to be in better health
57 when they first arrive compared to migrants from poorer countries. After a while in the country of
58 residence, we would expect living conditions to level off migrants' health, i.e. the length of stay in
59 the host country would modify the effect of country of origin on migrants' health.

60 2. Materials and Methods

61 *Studied population*

62 The main mission of Doctors of the World/*Médecins du Monde* (MdM) is to provide
63 access to healthcare through free social and medical services for people who face barriers
64 to the mainstream healthcare system. In Europe, MdM works mainly with vulnerable
65 people such as homeless people, drug users, destitute nationals, sex workers,
66 undocumented migrants, asylum seekers and Roma communities.

67 The programmes which collected our data are fixed clinics run by MdM or its
68 partners, which offer free primary healthcare consultations as well as social support and
69 information about the healthcare system and patients' rights with regard to accessing
70 healthcare. Ultimately, these programmes aim to help patients reintegrate into the
71 mainstream healthcare system, where this is legally possible. MdM programmes are run
72 predominately by volunteers (90% are volunteers and the remaining 10% are paid staff, of
73 which around 90% are health professionals - including nurses, general practitioners,
74 midwives, dentists, medical specialists, psychologists - and 10% are social workers,
75 support workers, mediators, translators). The MdM International Network has developed
76 a quantitative and qualitative information system that includes systematic patient data
77 collection and annual statistical analysis, narrative patient testimonies, de jure and de facto
78 legal analysis of healthcare systems, as well as identification of best practices.

79 For this analysis we based our sample on total population seen by MdM. In the end
80 we included 1356 adult migrants who consulted an MdM volunteer at one of the free
81 clinics run by MdM or its partners in 5 countries for the first time in 2014. These free clinics
82 are located in Munich (Germany), Alicante, Bilbao, Malaga, Seville, Tenerife, Valencia,
83 Zaragoza (Spain), La Chaux de Fonds, Neuchâtel (Switzerland), Istanbul (Turkey) and
84 London (United Kingdom). Unfortunately, we could not include patients seen in Greece as
85 their asylum status and length of stay in Greece were not available.

86 *Data collection*

87 Data was collected by MdM volunteers (doctors, nurses, social workers) through a
88 medical and social questionnaire administered to every new adult patient. The medical

89 questionnaire collected information on perceived health, vaccination, pregnancy and
90 contraception, experiences of violence, history of HBV, HBC and HIV testing, reasons for
91 consultation, and diagnoses at the end of the consultation. The social questionnaire
92 collected information on housing conditions, occupation and resources, administrative
93 situation, health coverage and obstacles to accessing healthcare. No ethics committee
94 approval was required for this study as it uses socio-medical data routinely collected by
95 health professionals. The medical records used in the study were collected and archived
96 under the supervision of health professionals and according to the national laws and
97 regulations of each country. The data used by the authors of this study was fully
98 anonymised.

99 *Outcomes*

100 We used two indicators of self-perceived health (SPH) in order to distinguish between
101 physical and mental health. We used the answers to the questions “How is your physical
102 health state?” and “How is your emotional and psychological health state” respectively
103 and categorized both of them (Very good and good versus fair, bad or very bad; the latter
104 three categorizations are referred to as “deteriorated self-perceived health” in the rest of
105 the paper).

106 *Covariates*

107 Two characteristics relating to patients’ migration status were used in the analysis:
108 residence status (residence permit, undocumented, asylum seeker) and length of stay in
109 the host country (in 3 categories: < 3 months, between 3 months and 5 years, more than 5
110 years), as well as four indicators of socioeconomic status (SES): housing conditions
111 (unstable/stable), income satisfaction (not enough/enough for basic needs), job (yes/no),
112 health coverage (yes/no). In the second part of the analysis, we used the Human
113 Development Index (HDI) of patients’ countries of origin [17].

114 *Statistical analysis*

115 Since self-perceived health is known to differ between men and women [18,19] –
116 although it should be noted that very few studies have analysed migrant health in
117 particular by gender [20] – all of our data has been analysed by gender.

118 Firstly, we estimated a logistic regression model which included demographics (age in
119 quartiles, country of residence, i.e. where people were interviewed and region of origin),
120 migration status (residence status and length of stay in the host country) and SES (housing
121 conditions, income satisfaction, job, health coverage).

122 Secondly, we created a binary variable indicating whether or not the person is from a
123 wealthy country (HDI above 0.5), using the cut-off point of 0.5 following Chaix et al. [17].
124 We tested whether the HDI of the country of origin is linked to our outcomes in men and
125 women (see full results online), then tested whether the effect of length of stay in the host
126 country modified these associations. We defined two categories of length of stay according
127 to the results of the first model (< 3 months, ≥ 3 months). In this final model, the Human
128 Development Index of the country of origin was added as a modifier to test the hypothesis
129 that individuals coming from a more developed country have better SPH [21] and that the
130 change in SPH is influenced by the amount of time spent in the host country.

131 **3. Results**

132 *Descriptive statistics*

133 The final data shows the results from 577 women and 767 men for physical SPH, and 576
134 women and 765 men for mental SPH.

135 Table 1 shows the descriptive statistics of each explanatory variable cross-referenced with each
136 dependent variable for men and women. We have presented the proportion of people who are in
137 good or very good health. We tested for the difference in the proportion of being in good or very
138 good health across genders. The results show that women in the first age quartile are more likely to
139 be in better mental health than men (31.9% vs 20.8%), and that men residing in Spain are more
140 likely to be in better physical health than women (50.0% vs 33.6%). Men from Africa are more likely
141 to be in better physical health than women (37.0% vs 26.6%). With regard to undocumented
142 migrants, women are more likely to be in better mental health (25.1% vs 15%) while men are more
143 likely to be in better physical health (43.3% vs 33.0%). When living in unstable accommodation,
144 men are more likely to be in better physical health than women (32.5% vs 22.7%). When income is
145 deemed insufficient, men are more likely to be in better health than women (33.6% vs 26.9%). When
146 migrants have a job, women are more likely to be in better mental health than men (30.0% vs 20.2%).
147 Finally, when migrants have health coverage, men are more likely to be in better health than
148 women (39.0% vs 28.6%).

149 Table 1. Proportion of people in very good or good health, by gender and covariates.

	n	Physical		Mental	
		Women %	Men %	Women %	Men %
Age group					
1st quartile [18;28[	310	30.1	41.1	31.9	20.8*
2nd quartile [28;34[	383	32.5	37.2	15.3	17.3
3rd quartile [34;44[	379	24.2	28.5	27.9	21.0
4th quartile [44;85]	284	24.1	23.7	29.7	26.6
Total	1356	27.6	33.4	25.7	20.9
Surveyed Countries					
Germany	46	24.0	28.6	36.0	19.1
Switzerland	30	50.0	25.0	66.7	29.2
Spain	210	33.6	50.0*	36.4	40.0
Turkey	552	31.0	39.7	8.0	6.6
United Kingdom	518	22.2	19.6	32.1	32.7
Total	1356	27.6	33.4	25.7	20.9
Origin					
Middle East	78	11.5	17.3	11.5	19.2
Africa	708	26.6	37.0**	13.9	11.6
Americas	110	40.5	36.1	33.8	27.8
Asia	327	25.3	24.9	39.0	38.1
Europe	49	25.9	40.9	40.7	31.8
Maghreb	84	30.0	45.5	40.0	34.1
Total	1356	27.6	33.4	25.7	20.9
Residence status					
Other documented	220	30.8	41.4	32.7	31.9
Undocumented	548	33.0	43.3*	25.1	15.0**
Asylum Seeker	588	21.3	21.2	23.3	22.7
Total	1356	27.6	33.4	25.7	20.9

Length of stay					
<3 months	218	19.2	40.3**	24.2	19.3
3 months-5 years	791	30.3	34.7	22.3	18.3
>5 years	346	27.7	25.0	32.9	29.0
Total	1356	27.6	33.4	25.7	20.9
Housing conditions					
Unstable	715	22.7	32.5**	17.1	15.5
Stable	641	31.8	34.6	33.1	28.2
Total	1356	27.6	33.4	25.7	20.9
Income satisfaction					
Not enough	1227	26.9	33.6*	23.0	20.5
Enough	129	31.8	29.6	41.2	27.3
Total	1356	27.6	33.4	25.7	20.9
Job					
Yes	874	25.3	27.9	23.8	21.3
No	482	32.8	42.1	30.0	20.2*
Total	1356	27.6	33.4	25.7	20.9
Health coverage					
Yes	364	28.6	39.0*	33.0	33.0
No	992	27.1	31.7	22.4	17.2
Total	1356	27.6	33.4	25.7	20.9

150 Comparing female proportion to male proportion., pvalues below 0.1%; 1% 5% are shown with three, two or
151 one star (resp).

152 *Multivariate models*

153 We will now discuss multivariate models in order to explain good health using logistic
154 regression.

155 *Asylum seekers*

156 One significant result of our study is the finding that asylum seekers are in worse health than
157 other documented patients. The results for both models and both genders are negative but are
158 significant only for female asylum seekers' physical SPH and male asylum seekers' mental SPH.
159 The physical SPH of female asylum seekers is twice as poor as that of other documented women.
160 Male asylum seekers are three times more likely to have worse mental SPH than other documented
161 men.

162 *Living conditions*

163 Living in stable accommodation is associated with better health. While this variable is positive
164 for both models and both genders, it is significant for women's physical and mental SPH, and
165 men's mental SPH. Women living in stable accommodation are twice as likely to be in better mental
166 SPH than women who do not have stable accommodation.

167 Finally, work is also associated with better health. This is significant for both the physical and
168 mental SPH of men. Men in employment are twice as likely to be in better mental SPH than men
169 who are not in employment.

170 *Length of stay (LOS)*

171 In *Table 2* we present the results for the following thresholds of length of stay: less than 3
172 months, between 3 months and 5 years, and more than 5 years. We tried different sensitivity
173 analyses following different research articles [22,23]. We tested the following durations of residence:

174 less than 3 months, between 3 months and 5 years, between 5 years and 10 years, and more than 10
 175 years¹. The only significant result is the finding that female migrants who have spent more than
 176 three months in their host country have better physical SPH than the women who have stayed for
 177 less than three months.

178 We did not find interpretative results for the mental SPH of men or women regarding the
 179 effect of length of stay on health. One interesting hypothesis is that women's physical SPH seemed
 180 to decrease in women who have stayed in their host country for more than 10 years. In a sensitivity
 181 analysis¹ document we tested different specifications to test this hypothesis of an inverted U shape
 182 effect of LOS on health. The resulting assumption is that health improves as the host country is
 183 wealthier than country of origin, then deteriorates as migrants tend to live in poor conditions and
 184 suffer discrimination. However, although this result appears in some specifications, it is not
 185 consistent across models.

186 Table 2. Multivariate analysis of characteristics associated with good or very good perceived
 187 Physical and Mental health, by gender.

	Wom		Men		Women		Men	
	n	%	%	Physical	Mental	Physical	Mental	
				aOR [95%CI]	aOR [95%CI]	aOR [95%CI]	aOR [95%CI]	
Age group								
1st quartile [18;28[	310	36.5%	63.5%	Ref.	Ref.	Ref.	Ref.
2nd quartile [28;34[	383	41.0%	59.0%	1.07 [0.61; 1.90]	0.52 [0.26; 1.00]	0.92 [0.60; 1.40]	0.96 [0.55; 1.69]
3rd quartile [34;44[	379	43.5%	56.5%	0.65 [0.36; 1.17]	0.63 [0.34; 1.15]	0.64 [0.41; 1.00]*	1.08 [0.61; 1.92]
4th quartile [44;85]	284	51.1%	48.9%	0.66 [0.35; 1.23]	0.59 [0.31; 1.10]	0.65 [0.38; 1.13]	0.89 [0.48; 1.64]	
Surveyed Countries								
Germany	46	54.3%	45.7%	Ref.	Ref.	Ref.	Ref.	
Switzerland	30	20.0%	80.0%	6.27 [0.81; 51.34]	4.84 [0.67; 44.95]	1.12 [0.27; 4.71]	3.10 [0.69; 15.55]	
Spain	210	52.4%	47.6%	0.53 [0.14; 2.12]	0.74 [0.21; 2.62]	2.14 [0.75; 6.76]	3.25 [1.00; 12.91]	
Turkey	552	33.9%	66.1%	0.91 [0.19; 4.45]	0.08 [0.02; 0.38]*	1.54 [0.40; 6.24]	0.11 [0.02; 0.55]*	
United Kingdom	518	48.6%	51.4%	0.38 [0.09; 1.68]	0.30 [0.08; 1.20]	0.61 [0.16; 2.43]	0.97 [0.23; 4.65]	
Region of Origin								
Middle East	78	33.3%	66.7%	Ref.	Ref.	Ref.	Ref.	

¹ All those results are available online in a Sensitivity Analysis document T1, T2, T3, T4.

	Wom en		Men %	Women		Men	
	n	%		Physical	Mental	Physical	Mental
				aOR [95%CI]	aOR [95%CI]	aOR [95%CI]	aOR [95%CI]
Africa	708	37.7%	62.3%	2.87 [0.85; 13.37]	2.20 [0.59; 11.35]	1.20 [0.53; 2.92]	0.82 [0.35; 2.06]
America	110	67.3%	32.7%	9.15 [2.12; 50.56]*	2.48 [0.55; 14.38]	0.75 [0.23; 2.44]	0.42 [0.12; 1.45]
Asia	327	44.6%	55.4%	3.73 [0.96; 19.14]	3.55 [0.89; 18.99]	2.16 [0.89; 5.73]	1.51 [0.66; 3.68]
Europe	49	55.1%	44.9%	2.75 [0.58; 15.91]	2.31 [0.50; 13.24]	1.77 [0.50; 6.33]	0.68 [0.18; 2.48]
Maghreb	84	47.6%	52.4%	4.14 [0.84; 24.91]	3.38 [0.66; 21.36]	1.92 [0.68; 5.68]	0.89 [0.30; 2.69]
Immigration Status							
Residence permit	220	47.3%	52.7%	Ref.	Ref.	Ref.	Ref.
Undocumented	548	41.4%	58.6%	0.70 [0.39; 1.28]	0.92 [0.50; 1.71]	1.09 [0.67; 1.78]	0.41 [0.22; 0.75]*
Asylum Seeker	588	42.3%	57.7%	0.50 [0.27; 0.94]*	0.73 [0.39; 1.41]	0.59 [0.35; 1.01]	0.32 [0.17; 0.60]*
Length of Stay							
<3 months	218	45.4%	54.6%	Ref.	Ref.	Ref.	Ref.
3 months-5 years	791	39.2%	60.8%	2.10* [1.14; 4.01]*	0.70 [0.37; 1.34]	0.75 [0.47; 1.19]	0.88 [0.49; 1.63]
>5 years	346	49.1%	50.9%	2.25 [1.08; 4.85]*	0.72 [0.35; 1.49]	0.63 [0.35; 1.16]	0.63 [0.32; 1.26]
Housing conditions							
Unstable	715	37.6%	62.4%	Ref.	Ref.	Ref.	Ref.
Stable	641	48.5%	51.5%	1.78 [1.18; 2.70]*	1.96* [1.26; 3.08]*	1.29 [0.91; 1.82]	1.57 [1.04; 2.39]*
Income satisfaction							
Not Enough	122 7	40.3%	59.7%	Ref.	Ref.	Ref.	Ref.
Enough	129	65.9%	34.1%	1.39 [0.76; 2.54]	1.22 [0.69; 2.17]	0.98 [0.46; 2.04]	0.47 [0.21; 0.99]*
Job							
No	874	45.8%	54.2%	Ref.	Ref.	Ref.	Ref.

	Wom en		Men		Women		Men	
	n	%	%	Physical	Mental	Physical	Mental	
				aOR [95%CI]	aOR [95%CI]	aOR [95%CI]	aOR [95%CI]	
Yes	482	37.3%	62.7%	1.32 [0.84; 2.06]	1.46 [0.89; 2.41]	1.82 [1.26; 2.62]*	2.16 [1.35; 3.49]*	
Insurance coverage								
Yes	364	50.0%	50.0%	Ref.	Ref.	Ref.	Ref.	
No	992	40.1%	59.9%	1.38 [0.59; 3.66]	1.80 [0.79; 4.52]	0.65 [0.29; 1.53]	1.67 [0.76; 3.96]	

188 aOR: adjusted Odds Ratio, 95%CI: 95% Confidence Intervals, *p<0.05

189 Wealth of country of origin and length of stay, effect modifier

190 Next, we tested the effect of the Human Development Index, firstly to determine its impact on
191 health and secondly to test whether the wealth of the country of origin is an effect modifier for
192 Length of Stay (LOS). Table 3 shows the results for women's physical SPH only. Full results are
193 available online. Introducing effect modifiers in male models did not change the general finding
194 that length of stay has no effect for males². Interaction models with LOS in three categories do not
195 provide much more information than LOS in two categories (less than 3 months and more than 3
196 months), therefore we have only presented interactions for the latter. The introduction of the effect
197 of wealth (effect modifier) does not change the results for the other covariates shown in *Table 2*.

198 The effect of the wealth of the country of origin shows that women from wealthier countries
199 have better physical SPH when they have stayed for less than 3 months compared to women from
200 poorer countries. The physical SPH of women from wealthier countries does not change with time
201 spent in the country. Women from poorer countries see their physical SPH improve with a length of
202 stay longer than 3 months. Similarly to LOS, we tried different specifications of the wealth cut-off
203 point and while some results were significant for men, they were not robust when tested with
204 different cut-off point specifications. However, the effect for women was similar regardless of the
205 wealth cut-off point (0.5; 0.6 or 0.7)³.

206 Table 3 Effect of LOS and Human Development Index; Effect modifier of length of stay on wealthy
207 country of origin (COO); regarding physical perceived health in women. __

	No interaction		With interaction; effect modifiers	
	aOR [95% CI]		aOR [95% CI]	
Effect of wealthy COO <u>vs</u> poor COO	1.94* [1.06; 3.56]		Effect of wealthy COO <u>vs</u> poor COO <u>when</u> LOS<3 months	5.96* [1.65; 21.49]
Effect of stay longer than 3 months <u>vs</u> stay shorter than 3 months	1.96* [1.05; 3.65]		Effect of stay longer than 3 months <u>vs</u> stay shorter than 3 months <u>when</u> women are from poorer countries	4.72* [1.51; 14.72]

² See Full tables online T5, T6.

³ The Sensitivity analysis document shows and annotates all of these results T7, T8.

No interaction	With interaction; effect modifiers
aOR [95% CI]	aOR [95% CI]
	Effect of stay longer than 3 months <u>vs</u> stay shorter than 3 months <u>when</u> women are from wealthy countries
	1.22 [0.59; 2.55]

208 * 1 is outside the confidence interval. Interpretation: when women have stayed less than 3 months, those
 209 from wealthier countries are 5.96 times more likely to be in good physical health compared to women from
 210 poorer countries. OR are adjusted on all the characteristics in Table 3.

211 4. Discussion

212 This study of migrant patients visiting MdM health centres in Europe provides an interesting
 213 insight into the health status of vulnerable migrants. This population is not homogenous and
 214 different factors impact on their health.

215 Firstly, we have learnt that the effect of being an asylum seeker compared to other documented
 216 migrants has a negative effect on women's physical SPH and men's mental SPH.

217 Secondly, when patients have better living conditions they tend to be in better health.
 218 Employment has a positive effect on both the physical and mental SPH of men. Stable
 219 accommodation has a positive effect on women's SPH (physical and mental) and men's mental
 220 SPH.

221 Lastly, the duration of stay in host countries has contradictory effects depending on the wealth
 222 of the country of origin. Women from poorer countries, as measured by the Human Development
 223 Index, see their physical SPH improve after 3 months of residing in the host country, whereas there
 224 is no effect for those from wealthy countries.

225 *Perceived health*

226 We used indicators of self-perceived health (SPH) to assess migrants' health. There is a strong
 227 body of evidence showing that SPH predicts mortality and morbidity as well as medical diagnosis
 228 [24,25]. It is a better predictor for underprivileged people [26] and/or those with lower levels of
 229 education. SPH has been shown to vary according to ethnicity [27]; however, Chandola and Jenkins
 230 have shown that there is no joint effect of SPH and ethnicity predicting morbidity [28], i.e. the
 231 predictability of SPH is not modified by ethnicity. A recent article showed that the effect of being a
 232 non-EU citizen living in the EU on SPH was similar to that of people who suffer from a chronic
 233 condition or report limitations in daily life [7].

234 *The health of asylum seekers*

235 Most of the literature concerns the health status of asylum seekers, refugees, and
 236 undocumented migrants [16]. This is consistent with policies and migration trajectories in host
 237 countries. These 3 administrative categories face risk factors for mental health disorders during
 238 premigration (persecution, armed conflicts, and economic hardship), perimigration (different kinds
 239 of violence, life-threatening conditions, separation from family and support network) and post
 240 migration. Once in the host country, while refugees struggle to fully integrate into society, asylum
 241 seekers also experience feelings of uncertainty about their asylum applications (the longer the
 242 procedure, the worse their mental health) and fear of detention. Toar et al. [29] have shown that
 243 asylum seekers have a higher level of self-reported post-traumatic stress disorder and
 244 depression/anxiety compared to refugees.

245 Our results show the negative effect of being an asylum seeker on women's physical health
 246 and men's mental health compared to other documented patients. These results are consistent with
 247 literature showing the significant impact of the stress of asylum procedures and living through a
 248 period of uncertainty [30].

249 Administrative situations can change over time. For example, asylum seekers may previously
250 have been undocumented, refugees may previously have been asylum seekers, and migrants may
251 become refugees or legal residents through other procedures. As such, in order to understand how
252 an administrative situation affects health, qualitative research may be more appropriate for
253 understanding the process by which health deteriorates. A combination of qualitative and
254 quantitative methods can help to provide insight into the process that results in individual health
255 status; for France, see Cagnet et al. [14].

256 *Health and living conditions*

257 Most research on health and being economically active focuses on the detrimental effect of
258 working conditions on health [31–33]. Others have shown that there is a selection effect of those in
259 good health into work [34], and at a macro-economic level that where there is better health there is
260 more widespread labour supply [35]. There is also evidence that more permanent employment
261 positions have a beneficial impact on individuals' mental health [36]. Labour force participation
262 reduces the risk of mortality, and being active lowers the risk of mortality when unmarried [37]. It
263 is a public health issue to facilitate access to the labour market in order to improve the health of
264 deprived communities [38–40].

265 In correspondence with these studies, our results show the positive impact of employment on
266 men's SPH (both physical and mental). There is no significant evidence for the same impact on
267 women's SPH. The population we have studied is specific as it cannot benefit from social protection
268 [41]. Furthermore, according to a 2015 MdM report [42], 66% of the patients do not have the right to
269 reside which means that they also do not have the right to work. As the remaining 34% of the
270 people who have the right to reside do not necessarily have the right to work, 66% is therefore an
271 underestimation of those who do not have the right to work. Employment is the primary way to
272 receive income in Western societies and can be perceived positively, even if the salary is low (91.3%
273 of MdM patients were living below the poverty line, and this figure does not take into account the
274 number of people living on this income).

275 Employment conditions for migrants and refugees are usually more strenuous than for host
276 populations [43]. Studies on migrant workers (44) have shown that migrants and refugees are at
277 higher risk of occupational exposure, injury and illness [44]. This is a result of their relegation to the
278 most dangerous jobs and the most dangerous tasks within these jobs, a lack of safety training, the
279 transient nature of much of the work, fear of reprisal for demanding better conditions or reporting
280 an injury or illness, and linguistic and cultural complexities that eliminate or severely minimize the
281 existence and effectiveness of training [44].

282 As such, migrants in employment are in better health than those who are not; though those in
283 employment suffer from detrimental working conditions.

284 Our study shows the positive impact of stable accommodation on both women's physical and
285 mental SPH and men's mental SPH. Fazel et al. [45] have shown that homeless individuals have
286 worse mortality outcomes than the general population in Europe and the USA. In these countries,
287 various programmes have been developed to provide stable and safe accommodation for the
288 homeless. Programme evaluations show the positive impact of housing on health, but few research
289 studies [46] have been developed to understand the impact of unstable accommodation on physical
290 and mental health. Robert and Vanoni [46] argue that poor housing increases the risk of health
291 issues and violence. A study of female patients in Médecins du Monde in the Paris region show that
292 44% had experienced violence in their host country and 6% had been raped. Among female victims
293 of violence, 55% reported negative effects on their health. Violence may also be enacted by close
294 acquaintances such as the person(s) hosting the migrants [47]. In France, among homeless families
295 who had accommodation, 3.1% left their previous accommodation due to violence or exploitation
296 by the host [48].

297 As argued in the Ottawa Charter, shelter is a fundamental condition for health [49]. Our
298 evidence shows that we can go further than this to argue that shelter must be stable and safe in
299 order to be a fundamental condition for health.

300 *Health - length of stay versus wealth of country of origin*

301 Our results show that length of stay, and length of stay stratified by wealth of the country of
302 origin, have no impact on men's health, and the same is true of women's mental health. Length of
303 stay has an impact on women's physical SPH (female migrants that have spent between three
304 months ten years in their host country are 2.5 times more likely to be in better physical health than
305 women who have stayed for less than three months). Women from wealthier countries are 6 times
306 more likely to be in better health than those from poorer countries on arrival (less than three
307 months). Women from poorer countries are over 4 times more likely to be in good health when they
308 stay for longer than 3 months. There is no effect for migrants staying for longer than ten years.

309 These results are consistent with the notion that migrants coming from a country in an earlier
310 phase of the health transition to a society in a more advanced phase experience a positive effect on
311 their health [3]. After a little while in their host countries, women from poorer countries see an
312 improvement in their physical health. Our results reveal an interesting gender difference, which
313 may be explained by the more frequent use of health facilities by women.

314 The role of social class in health inequality has been well documented [50]. On the topic of
315 migrant populations, Borrell et al. [51] have studied how social class in host countries may mediate
316 the impact of migration status on health. However, Gosselin et al [52] have shown that
317 sociodemographic factors from the country of origin have little impact on the settlement of
318 sub-Saharan African migrants in France.

319 We tested different models in order to gain information about the impact of length of stay in
320 the host country on migrants' health. We have shown that LOS has a positive effect on women's
321 physical SPH. However, the hypothesis of an inverted U shape effect of LOS on health could
322 become a potential object of further study.

323 *Limitations*

324 It should be noted that our study is not representative of the health status of vulnerable
325 migrants. Firstly, our study is limited to MdM patients. It is likely that vulnerable migrants have
326 different networks regarding health, depending on factors such as host country and country of
327 origin. Moreover, some may not have access to health facilities. Secondly, the profile of patients also
328 depends on the health centre. For example, as the health centre in Turkey is managed by
329 individuals from sub-Saharan Africa, it tends to work with migrants from this region
330 predominantly.

331 The term "migrants" in the results shown refers to migrants seen by MdM and partners.

332 We are aware that our findings are not a result of multiple hypothesis testing. We limited our
333 ambitions to one effect modifier only as we are cautious not to test for every possible interaction.
334 Moreover, when testing different sensitivity analyses we focused on the results which remained
335 robust when tested with different specifications.

336 **5. Conclusions**

337 Stable and safe accommodation is a fundamental condition for health. Therefore, we
338 recommend that countries who ratified the International Covenant on Civil and Political Rights, as
339 well as the European Convention on Human Rights, to implement the right to housing.

340 In light of the positive effect of employment on social integration and its short-term health
341 benefits, we would recommend facilitating access to the job market for migrants.

342 Longitudinal cohort studies on migrant populations are required to better understand the
343 impact of work and poor housing on health, taking into account the different types of work and
344 housing and the evolution of these social determinants over their lifetimes. These kinds of studies
345 will also take into account the trajectories of migration, which appears to be a better way to
346 understand migrant health. Qualitative studies may also provide insight into migrant pathways.
347 Further studies are required to better understand the factors which affect health in the country of
348 origin as well as in the host country, and which impact migrants at the various stages of their lives.

349

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