

Long-Term Health Consequences of Movement Restrictions for Palestinians, 1987–2011

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Objectives. To estimate the long-term association between Israeli-imposed restrictions on travel for medical care in the occupied Palestinian territory and health status in adulthood.

Methods. Using event history calendar methods, we collected annual data from 1987 to 2011 from a representative sample of 1778 Palestinians aged 32 to 43 years and analyzed the subsample of whomever had a serious medical condition and needed to travel for medical care ($n = 246$; contributing 1163 person-years). We used ordered logistic regression with person-year data to test the association between movement restrictions from 1987 to 2011 and health status in 2011.

Results. Two thirds (65%; $n = 161$) of participants reported travel restrictions, and 38% ($n = 92$) reported ever being barred from travel for medical care. Compared with study participants who experienced no travel restrictions in a year ($n = 559$ person-years), those who were barred from travel in that same year ($n = 122$ person-years) reported worse self-rated health (57% vs 22% reported bad or very bad self-rated health; $P < .05$) and greater limits on daily functioning caused by physical health (41% vs 16% reported regular limits; $P < .05$).

Conclusions. Being barred from travel for medical care was associated with poor health as long as 25 years later. (*Am J Public Health.* 2018;108:77–83. doi:10.2105/AJPH.2017.304043)



See also Shannon, p. 13; and Clarfield and Dechtman, p. 15.

The World Health Organization has identified widespread movement restrictions during political conflict as a fundamental social determinant of poor health.¹ Since 1967, movement restrictions on Palestinians in the West Bank, East Jerusalem, and the Gaza Strip (Gaza) have limited prompt access to medical care. The West Bank and East Jerusalem have been segmented into smaller and smaller disconnected areas by Israeli settlements, separation walls and fences, and Israeli-only roads connecting the settlements. Israel restricts movement between and within the territories through a complex system of comprehensive closures barring travel both between and outside of the territories; internal closures that bar Palestinians from leaving their town, village, or refugee camp; and curfews that bar Palestinians from leaving their homes, sometimes for days at a time. These movement restrictions are

enforced through more than 600 permanent checkpoints and roadblocks, several thousand temporary or “flying” checkpoints, and a complex permit system of more than 100 different types of travel permits.^{1–5}

The Palestinian health system, like most health systems, is structured such that the major hospitals and specialty clinics are located in population centers. Primary health centers located in villages, towns, and refugee camps refer patients to specialty clinics and

hospitals as needed.⁶ Consequently, movement restrictions can result in delayed, inadequate, or no medical care.^{2,3,7} Between 2002 and 2011, the US State Department documented 2159 times ambulances were prevented or delayed from passing through checkpoints, 194 Israeli military attacks on ambulances, and 79 Israeli attacks on emergency response teams.⁸ For years, pregnant women who needed to travel to a hospital have had to reapply for a travel permit every few days during their last month of pregnancy.³

Israel also has severely restricted access to medical care in Gaza, particularly since the imposition of a severe blockade in 2007. These restrictions include barring the importation of medicines and equipment, barring people from leaving Gaza for specialized medical training, and the physical destruction of medical facilities, the sole power plant, and water treatment plants.⁵ The Palestinian Ministry of Health must request permits for patients who cannot receive proper treatment in Gaza to travel to East Jerusalem, the West Bank, Jordan, or elsewhere for medical care. As the conditions of health facilities in Gaza deteriorate, permit requests have increased from 305 during the first quarter of 2008 to 7809 during the first quarter of 2017.^{9,10}

Researchers and human rights organizations have documented incidents of impaired health and even death caused by movement restrictions, but the long-term health burden of movement restrictions is not known.^{5,7,8} This study addresses that gap directly.

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METHODS

We selected a representative sample from the West Bank, East Jerusalem, and the Gaza Strip, including people who were adolescents between 1987 and 1993, which was a period of heightened political conflict and high political activism called the first intifada. This particular cohort experienced political conflict throughout their lifetime, which allowed for the study of health in the context of long-term conflict.¹¹ At the time of interview, study participants were aged 32 to 43 years.

We drew a stratified cluster random sample based on 2007 Census data from the Palestinian Bureau of Central Statistics (PCBS). From 16 strata based on region, urbanicity, and refugee camp status, we randomly selected 90 population clusters with probability proportional to size. We randomly selected households with replacement in each cluster with probability proportional to size using 2007 census maps. We randomly selected a person 32 to 43 years of age from the household by using the Kish table method. In total, 1778 respondents were interviewed, representing a 97% response rate. All participants provided written informed consent.

Data Collection

In September and October 2011, Palestinian Center for Policy and Survey Research field workers conducted household interviews. Both a male and a female field worker were present at each interview to avoid culturally problematic cross-gender pairings (e.g., a male researcher alone interviewing a female or vice versa). The interviewers administered a survey of adult functioning and an event history calendar (EHC), both of which were developed with key Palestinian research partners. The data collection instruments were written in English, translated to Arabic, translated back to English, and then extensively piloted in Gaza and the West Bank.

The EHC documented events in multiple domains of the lives of Palestinians between 1987 (when the mean age of the sample was 12 years) and 2011 (year of interview), including the experience of serious medical problems and movement restrictions. EHC is a highly respected method of assessing a biographical history of an individual.^{12–18} The

method uses a calendar grid that has events listed on one side and the time units (in our case, years) listed across the top. The interviewer and respondent fill out the EHC together using validated strategies to enhance accurate recall, such as cross-checking responses across domains. The approach is ideally suited to settings of political conflict, where prospective longitudinal research is difficult and episodes of conflict serve as key anchoring events to aid recall of other, less salient, events.¹²

Measures

One outcome measure was self-rated health (SRH), a globally used measure of general health status that consistently predicts objective health status¹⁹ and mortality,²⁰ including in Palestinian samples.^{21,22} SRH is measured with a single question: “In general, how would you describe your health?” Response categories ranged from “very bad” to “excellent.” We used the terminology “bad” rather than the more typical phrasing of “poor” based on the back translation from Arabic to English. The appropriateness of the Arabic term was verified with our Palestinian research partners. We collapsed responses into 3 categories: bad or very bad, average, and good or excellent; and reverse-coded the score to predict poor health.

We derived the second outcome measure from qualitative interviews that grounded the overall study; we labeled it “limits on daily functioning due to physical health.”²³ Respondents were asked: “How often does your physical health limit your ability to meet the other demands in your life such as financial, education, or family responsibilities?” Responses ranged from “never” to “regularly.” Consistent with Palestinian culture, this question refers to the ability to meet societal and familial obligations, and not just activities of daily living. We collapsed responses into 3 categories: never or rarely, sometimes or often, and regularly. The correlation between SRH and limits on daily functioning caused by physical health was 0.53 ($P < .001$).

To measure movement restrictions, field workers asked: “Sometimes people want or need to travel for various reasons, such as to receive medical care, to go to work, to go to school, to visit family, or for religious observances. Sometimes people are barred from

leaving and sometimes they are permitted to leave directly or after a delay. First, I would like you to think about the times you needed to travel for medical care. Was there ever a time when you needed to travel to receive medical care?” For each year of the EHC, the field workers could record up to 3 different types of travel restrictions: respondents did not need to travel for medical care; respondents were permitted to travel without delay; respondents were permitted to travel after a delay (e.g., detention, interrogation); respondents were barred from travel; respondents knew of a closure, checkpoint, or other barrier so they did not try to travel; or respondents found a way to travel for medical care although they were not permitted. Respondents could report more than 1 type of restriction in each year. The term “travel” was selected after consultation with Palestinian colleagues. Israel has more than 100 types of travel permits for Palestinians to pass through Israeli barricades, walls, checkpoints, fences, or other physical impediments.²⁴ Travel, therefore, signified going somewhere one is not freely allowed to go, which could even be a distance of a few hundred meters from home.

We created 5 categories of travel restrictions: no restrictions; barred from travel or knew would not be allowed, so did not try; permitted after a delay; both barred and delayed; and multiple types of movement restrictions, a heterogeneous category that included respondents who were both permitted and restricted from travel for medical care in a single year. We used the terms movement restrictions and travel restrictions interchangeably.

The field workers also recorded the years in which the respondents had a serious medical condition using the prompt, “I want to ask about your and your family’s health. First, think about your health. Have you ever had a serious medical problem? If so, in what years?” Only serious medical conditions were recorded because of the challenge of recalling minor health conditions. Control variables included gender, region (West Bank, East Jerusalem, Gaza), number of years respondents had a serious medical condition, and number of years respondents needed to travel for medical care when they had a serious medical condition. Another control variable included 4 clearly demarcated political

periods in the Palestine-Israel conflict: the first intifada (1987–1993), the Oslo period (1994–1999), the second intifada (2000–2005), and the period after the second intifada (2006–2011). Resource adequacy was another control variable, which was the mean response to 3 questions regarding the adequacy of food, clothing, and housing in the past 6 months ($\alpha = 0.82$; range = “never” [1] to “regularly” [5]).

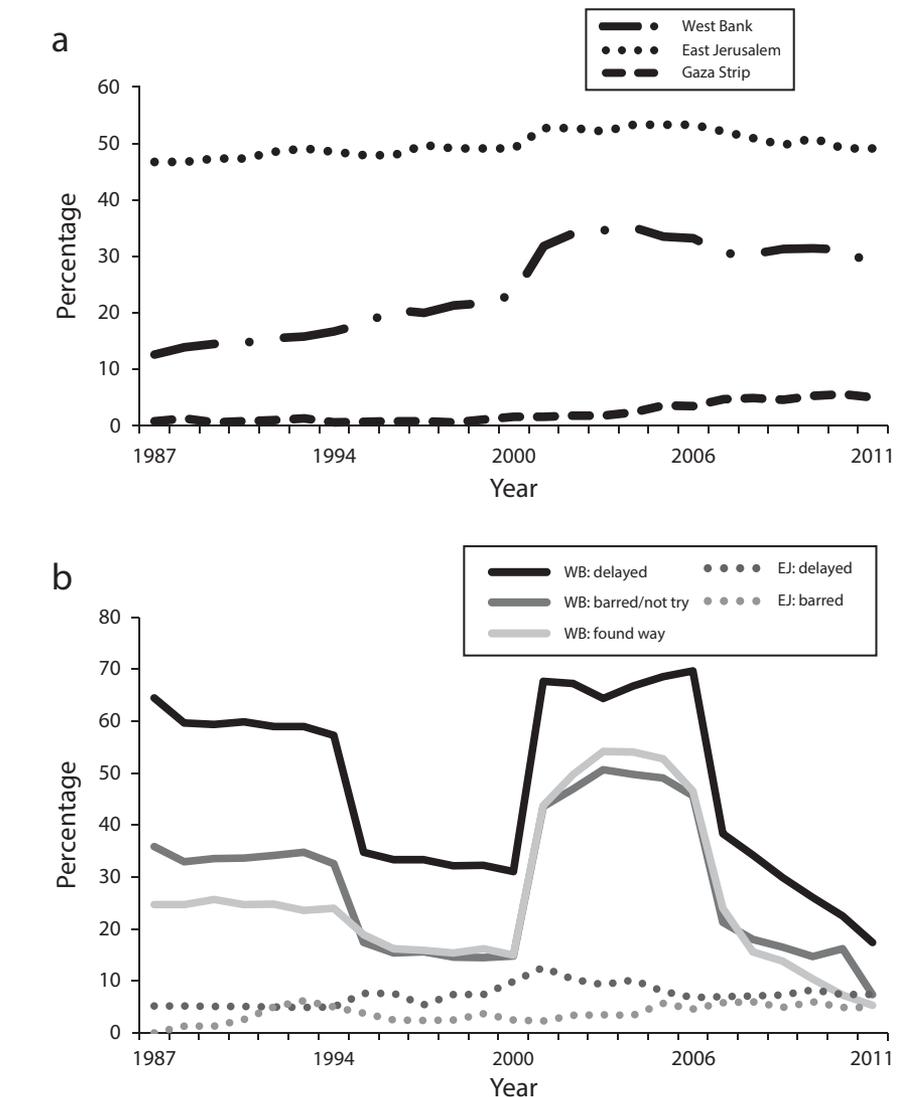
Analysis

We conducted all analyses in Stata version 14.2 (StataCorp, College Station, TX), and we adjusted for the complex sampling design using *svy* commands for bivariate analyses and sandwich estimators of the SEs for the multivariate analysis.^{25,26} For the bivariate analyses, we adjusted the *P* values using the Bonferroni method. We used ordered logistic regression with person-year data to estimate the association between travel restrictions and adult health status, controlling for potential confounders. Preliminary analyses confirmed residual variances were homogeneous and that the parallel effects assumption was not violated.^{27,28} We used listwise deletion for missing data because less than 1% of data were missing. To test whether the effects of travel restrictions depended on when they occurred in the life course, we included period-by-travel restriction interaction terms. Finally, we estimated predicted probabilities to aid interpretation.

RESULTS

A total of 448 respondents (25% of the full sample) reported ever having a serious medical problem, and of these, 246 (53%) reported ever needing to travel for medical care in the same year they had a serious medical condition. Residents of the West Bank and East Jerusalem were most likely to have needed to travel for medical care in a year they had a serious medical condition (69% and 66%, respectively, compared with 30% of Gazans; $P < .001$). Figure 1 shows that the annual incidence of needing to travel for medical care was highest in East Jerusalem.

Among the 246 respondents who needed to travel for medical care in a year they had a serious medical condition, 52%



Note. EJ = East Jerusalem; WB = West Bank. Percentage of respondents with a serious medical condition who needed to travel for medical care, by region and year, were calculated from 448 individuals who ever had a serious medical condition. The denominator contains the number of persons who reported a serious medical condition in that year and hence varies across years. Types of travel restrictions experienced each in the WB and EJ were calculated from 246 individuals who ever had a serious medical condition and needed to travel for medical care. The denominator contains the number of persons who reported a serious medical condition and needed to travel in that year and hence varies across years.

FIGURE 1—Incidence Among Respondents With a Serious Medical Condition of (a) Needing to Travel for Medical Care and (b) Travel Restrictions: West Bank, East Jerusalem, and the Gaza Strip; 1987–2011

(unweighted $n = 128$) were male, 91% ($n = 224$) were married in 2011, 68% ($n = 174$) resided in the West Bank, 22% ($n = 49$) resided in Gaza, and 10% ($n = 23$) resided in East Jerusalem. Respondents, on average, reported adequate food, clothing, and housing (mean \pm SD = 3.86 \pm 1.02; range = 1–5). On average, the 246 respondents needed to travel for medical care

during 4.7 \pm 5.64 years (range = 1–25 years), resulting in a total of 1163 years, hereafter called person-years.

Nearly two thirds (65%) of the 246 respondents (unweighted $n = 161$) reported that their movement had been restricted at least once; 45% ever had their travel delayed ($n = 111$), 38% had been barred from travel ($n = 92$), 25% had ever found a way to get to

medical care although they were not permitted to travel for that care (e.g., traveling around checkpoints; n = 63), and 3% had ever not sought medical care because they knew of a closure or that they would not be permitted (n = 7). There were no statistically significant differences between men and women in the prevalence of travel restrictions.

Travel restrictions varied by region, as shown in Figure 1. In the West Bank, travel was most restricted during the first and second intifadas, which were periods of intense political conflict when 60% to 70% of those who needed to travel for medical care had their travel delayed, 35% to 50% had their travel completely barred, and 35% to 50% were able to reach medical care although they were not permitted to travel because they could use back roads or pathways to avoid main-road checkpoints that enforced a closure or curfew.

In East Jerusalem, the percentage of respondents that reported any restriction on travel for medical care remained less than 10% in most years, regardless of the level of political conflict. No East Jerusalem residents reported accessing medical care even when not permitted, most likely because they faced

fewer restrictions and greater difficulty circumnavigating checkpoints and barriers in urbanized East Jerusalem. Because of the low incidence of needing to travel for medical care in Gaza (Figure 1), we could not reliably estimate the annual incidence of movement restrictions in that region.

To assess the validity of the reports of travel restrictions, we compared data from the EHC to documented reports of movement restrictions. Figure 2 shows an inverse relationship between the number of comprehensive closure days (bans on all travel by Palestinians into and out of the occupied Palestinian territories) and the percent of West Bank study participants who reported no restrictions on travel for medical care. The EHC data in Figure 2 is also consistent with reliable reports of internal closures within the West Bank. The US State Department documented internal closures within the West Bank from 2000 to 2005. Internal closures only allowed “Palestinians with special permits for work or health services to leave cities and pass through checkpoints on main roads.”³⁰ The number and length of internal closures increased after the start of the

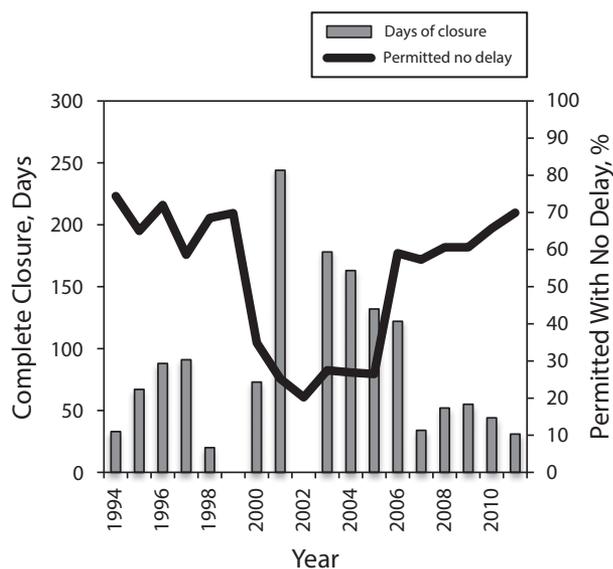
second intifada, from 81 days in 2000 to 287 days (plus 87 days of partial internal closure) in 2001. The number of internal closure days remained high through the end of the second intifada in 2005 (365 days), and then the US State Department did not report on internal closures until 2008 (36 days).³

Study participants who had a serious medical condition and were barred from travel for medical care were more likely to report bad or very bad SRH in 2011 compared with respondents permitted to travel for care directly (57% vs 22%; odds ratio [OR] = 4.33; 95% confidence interval [CI] = 1.46, 12.82) and also more likely to report regularly experiencing limits on daily functioning caused by their physical health (41% vs 16%; OR = 5.36; 95% CI = 1.58, 18.21) (Table 1).

These large differences in health status persisted in multivariate models (Table 2). Respondents barred from travel or who did not try to travel because they knew they were not permitted were 4.3 times more likely to rate their health lower in 2011 (OR = 4.30; 95% CI = 1.43, 12.91) and 6.5 times more likely to report greater limits on daily functioning caused by their physical health (OR = 6.49; 95% CI = 2.06, 20.45) compared with those permitted to travel for medical care without any restrictions. The large CIs around the ORs for being barred from travel are because ORs operate on a log scale that results in large, asymmetric CIs when the ORs themselves are large.³¹ Those permitted to travel after a delay were nearly twice as likely to report greater limits on daily functioning because of physical health than those permitted to travel without restrictions (OR = 1.93; 95% CI = 1.06, 3.48). However, they did not report lower SRH.

None of the restriction-by-period interaction terms was statistically or substantively significant, suggesting both long- and short-term health consequences of being barred from travel for needed medical care. We could not test for period-specific effects during the Oslo period because of the small sample size in that period. Additional models included controls for exposure to political violence (ever shot at, ever hit or kicked, or ever injured), each measured annually on the EHC. The substantive findings did not change.

To facilitate interpretation of the ORs for being barred from travel, we estimated the predicted probability of each health outcome,



Note. Data on days of complete closure were reported to B'Tselem by the Israeli Defense Forces Spokesperson's Office and the Ministry of Defense.²⁹ No data were available on the number of complete closures in 1999 or 2002. Because data from 1994 to 1998 were reported separately for the West Bank and the Gaza Strip, we could not determine the total days of closure in the occupied Palestinian territory overall. Closures in the Gaza Strip had a similar prevalence to closures in the West Bank.

FIGURE 2—Comparison of the Percent of the Sample That Experienced No Delays When Traveling for Medical Care to the Days of Complete Closure in the West Bank, East Jerusalem, and the Gaza Strip; 1987–2011

TABLE 1—Bivariate Association Between Travel Restrictions Between 1987 and 2011 and Health Status in 2011 Among a Population-Based Sample of Palestinians Who Had a Serious Medical Condition and Needed to Travel for Medical Care in the Same Year: West Bank, East Jerusalem, and the Gaza Strip; 1987–2011

Characteristics	Permitted to Travel Directly, % (n = 559)	Permitted After Delay, % (n = 198)	Barred/Did Not Try, % (n = 122)	Barred/Did Not Try and Delayed, % (n = 38)	Found Way Though Not Permitted, % (n = 28)	Multiple Travel Restrictions, % (n = 218)
Self-rated health						
Good or excellent	15.7	11.6	8.2 ^a	15.8	3.6	30.3
Average	62.1 ^b	76.8 ^{a,b}	34.4 ^{c,d}	63.2	71.4	48.6 ^{b,d}
Bad or very bad	22.2 ^b	11.6 ^b	57.4 ^{a,c,d}	21.0	25.0	21.1 ^b
Limits on daily functioning						
Never or rarely	32.7 ^a	11.6 ^{c,e}	5.7 ^{a,c,d,e}	29.0 ^a	64.3 ^{a,b,d,f}	21.1
Sometimes or often	51.5	68.2	53.3	31.6	28.6 ^a	74.3 ^e
Regularly	15.7 ^b	20.2	41.0 ^{a,c}	39.5	7.1	4.6 ^b

Note. Unweighted n = 1163 person-years.

^aDifferent from multiple restrictions, $P < .05$.

^bDifferent from barred or did not try because of closure, $P < .05$.

^cDifferent from permitted with no delay, $P < .05$.

^dDifferent from permitted after delay, $P < .05$.

^eDifferent from found a way even though not permitted, $P < .05$.

^fDifferent from travel barred or did not try and delayed, $P < .05$.

setting the values of all control variables at their means and the value of the other travel restriction variables (e.g., delayed, found a way although not allowed) at zero, thereby making the comparison group no travel restrictions. The predicted probabilities could be interpreted as the probability of experiencing a given level of SRH in 2011 if one had been barred from travel in any year. The model predicted that 56% of those who reported being barred at least once also reported bad or very bad SRH compared with 23% of those who experienced no travel restrictions. Similarly, the model predicted that 41% of those ever barred regularly experienced limits to daily functioning caused by their physical health in 2011 compared with 9% of those allowed to travel without delay. The predicted probabilities were based on the assumption that each travel restriction was an independent event, when in actuality the effects of being barred from travel could be cumulative.

DISCUSSION

International organizations have credibly documented cases of immediate negative health consequences caused by the Israeli-imposed movement restrictions in the occupied Palestinian territory.^{2,5} This study made a fundamental contribution by

estimating the population-based incidence of movement restrictions that impeded access to necessary medical care during a 25-year period in a representative cohort of young people, as well as the long-term associations of those movement restrictions with adult health status. We found that between 1987 and 2011, 65% of Palestinian adolescents and young adults in this population-based sample who had a serious medical condition and needed to travel for care reported that Israeli authorities had restricted their access to medical care at least once. The pervasiveness of restrictions varied with the intensity of the Israeli–Palestinian conflict and by geographic location, and the patterns of restrictions were consistent with multiple external reports.^{2–5,8,24,32} The most severe movement restriction—being completely barred during an entire year—was associated with poorer SRH and greater limits on daily functioning caused by physical health as long as 2 decades after the movement restriction occurred.

Strengths

This study has several strengths. First, we achieved a high response rate (97%) in this population-based sample of young people who were children and adolescents during the first intifada. Second, our study used both

a widely validated measure of SRH and a locally derived measure that reflected the intertwining of well-being with family and societal obligations in Palestinian culture. The results were consistent across both outcomes. Third, with the aid of an EHC, we measured movement restrictions with great specificity, including a validation of their time course, which allowed for the identification of the type of restrictions that were most damaging to long-term health. Fourth, except in the case of Gaza (11% of the sample), movement restrictions were typically exogenous to the medical condition, because they depended primarily on the locale in which a Palestinian lived.

Limitations

The study also had limitations. The findings could be biased upward if people in poor health in 2011 were more likely to remember the times their access to medical care was barred. By contrast, we might have underestimated the long-term health burden of movement restrictions because we measured only serious medical conditions in the EHC because of the difficulty of recalling quotidian illnesses over 25 years.

Finally, regarding the contemporary situation, movement restrictions have intensified since 2011. In the past 2 years, for example,

TABLE 2—Odds Ratios From Ordered Logit Models for Current (2011) Self-Rated Health and Limits on Daily Functioning Caused by Health: West Bank, East Jerusalem, and the Gaza Strip; 1987–2011

Characteristics	Self-Rated Health (Higher Score Reflects Poorer Health) OR (95% CI)	Limits on Daily Functioning Caused by Health OR (95% CI)
Type of travel restrictions during year ^a		
Permitted to travel after delay	0.72 (0.42, 1.23)	1.93 (1.06, 3.48)
Barred or did not try because of closure	4.30 (1.43, 12.91)	6.49 (2.06, 20.45)
Found a way though not permitted	1.70 (0.56, 5.18)	0.27 (0.05, 1.52)
Barred and delayed	0.73 (0.25, 2.10)	2.56 (0.31, 21.51)
Multiple travel restrictions	0.42 (0.09, 1.95)	0.81 (0.42, 1.56)
Period ^b		
First intifada (1987–1993)	0.85 (0.45, 1.59)	1.72 (0.86, 3.40)
Oslo period (1994–1999)	0.80 (0.55, 1.18)	1.34 (0.83, 2.16)
Second intifada (2000–2005)	1.02 (0.65, 1.60)	0.78 (0.53, 1.12)
Region ^c		
East Jerusalem	0.32 (0.10, 1.02)	0.15 (0.02, 0.80)
Gaza Strip	0.83 (0.26, 2.64)	0.42 (0.12, 1.50)
Female	1.12 (0.51, 2.46)	0.72 (0.33, 1.59)
Resource adequacy	0.75 (0.51, 1.11)	0.62 (0.38, 1.02)
No. of years had medical problem	1.01 (0.95, 1.07)	0.98 (0.93, 1.04)
No. of years had medical problem and needed to travel	1.03 (0.97, 1.10)	1.06 (0.99, 1.13)
McFadden Pseudo R^2	0.066	0.133

Note. CI = confidence interval; OR = odds ratio. Unweighted n = 1163 person-years.

^aReferent group is permitted to travel with no delay.

^bReferent group is recent period (2006–2011).

^cReferent group is the West Bank.

Israel implemented pervasive movement restrictions in the West Bank and East Jerusalem in response to acts of violence by individual Palestinians. The blockade of Gaza continues, and the proportion of travel permits granted to patients requesting to leave Gaza for medical care (usually to go to East Jerusalem) has fallen steadily from 85% in 2014 to 51% in the second quarter of 2017.^{5,10}

Public Health Implications

We found a large and long-lasting association between being barred from travel for necessary medical care from preadolescence to adulthood and poor health status in adulthood. The consequences of movement restrictions might be even more severe later in life, when the effects of untreated chronic disease become more evident. Beyond impairing the health of individuals, these findings have consequences for the public health system

itself. The systematic use of movement restrictions creates enormous inefficiencies and reduces the quality of care that is available.³³ In addition, these findings have relevance to current political conflicts throughout the world, such as in Syria (<http://www.state.gov/j/drl/rls/hrrpt/humanrightsreport/index.htm?year=2016&dclid=265520>), Somalia (<http://www.state.gov/j/drl/rls/hrrpt/humanrightsreport/index.htm?year=2016&dclid=265300>), and Myanmar (Bumma; <http://www.state.gov/j/drl/rls/hrrpt/humanrightsreport/index.htm?year=2016&dclid=265324>), where governments and rebel groups impose widespread movement restrictions on civilian populations and limit or prohibit access for humanitarian aid agencies to provide medical care and public health services.

The Fourth Geneva Convention requires that an occupying power be responsible for the medical care of the occupied population.³⁴ The State of Israel ratified this

convention but has persistently engaged in movement restrictions of Palestinians needing medical care, even during periods of low conflict. These restrictions also violate the principle of medical neutrality, identified by the World Health Organization as a primary social determinant of health.¹ The fundamental cause of disease in this case is political, and so too must be the solution. **AJPH**

CONTRIBUTORS

C. A. McNeely developed the research question, designed and conducted the analysis, and wrote the first draft of the article; she also contributed to the survey design and training of field workers for data collection. B. K. Barber originated and led the study from which the data were drawn, including the data collection instruments and methods, and he assisted with interpreting results and edited drafts of the article. R. Giacaman and M. Daher contributed to the design of the data collection instruments, assisted with interpretation of results, and edited drafts of the article. R. F. Belli contributed to designing the event history calendar and edited the article.

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HUMAN PARTICIPANT PROTECTION

The study was approved by the institutional review boards of the University of Tennessee, Knoxville, and the Palestinian Center for Policy and Survey Research, Ramallah, West Bank, occupied Palestinian territory.

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