

Double jeopardy: assessing the association between internal displacement, housing quality and chronic illness in a low-income neighborhood

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Abstract

Purpose This study analyzed associations between war-related internal displacement, housing quality and the prevalence of chronic illness in Nabaa, a low-income neighborhood on the outskirts of Beirut, Lebanon.

Methods A cross-sectional survey of sociodemographics, household characteristics and health conditions of the study population was carried out in 2002. Using a structured questionnaire, the research team surveyed 1,151 households representing 4,987 residents of all ages. The survey was administered to a proxy respondent from each household in face-to-face interviews. A multiple logistic regression model using the generalized estimation equation method was constructed to assess the simultaneous effect of displacement and housing quality on reported ill health, while adjusting for potential confounders.

Results Housing quality and internal displacement were strongly associated with occurrences of chronic illness. The most vulnerable respondents were older residents, females and internally displaced people, who reported high rates of chronic illnesses. Residents with high levels of education were less likely to report a chronic illness than those that had elementary education or less.

Conclusion Nabaa residents' experience of poor health was associated with inadequate housing quality. Moreover, residents who have been displaced experience worse living conditions and were more likely to experience poor health than those who were not displaced. These results reveal a need for policies to improve housing quality and alleviate war-related consequences in low-income neighborhoods.

Keywords Housing quality · Domestic environment · Internal displacement · Chronic illness · Low-income neighborhood

Introduction

Over the past decade, research interest has increased in exploring various environmental factors affecting the health of urban dwellers. Research-based evidence shows that health is affected by personal characteristics as well as by the living environment, including housing and surroundings (Diez Roux 2001; Pickett and Pearl 2001; Riva et al. 2007; Macintyre et al. 2008; Muhajarine et al. 2008; Poortinga et al. 2008). Adequate housing conditions are important for the physical and psychosocial well-being of individuals (Lawrence 2006). Despite methodological difficulty in establishing a direct association between housing quality and health, research is increasingly demonstrating that poor housing conditions have negative impacts on health (Lowry 1991; Bonnefoy et al. 2003; Shaw 2004; WHO 2004; Bonnefoy 2007; Habib et al. 2006, 2009; Harpham 2009; Jacobs et al. 2009; Jia et al. 2009). Moreover, poverty-stricken individuals are more likely to experience a heavier burden of illness and are prone to live in more inadequate housing conditions and neighborhoods compared to their counterparts (Illsley and Svensson 1990; Bonnefoy 2007; Poortinga et al. 2008).

A number of inadequate housing conditions, such as dampness and the presence of molds, have been associated with respiratory ailments in children and adults (Zock et al. 2002; Spengler et al. 2004). Crowding is linked to increased spread of infectious diseases (Baker et al. 2000; Krieger and Higgins 2002). Other associations found between the built environment and health include pest

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infestations, which often have been associated with allergies (Phipatanakul et al. 2000; Wang et al. 2008), and indoor thermal comfort (cold or hot), which is associated with increased risk of cardiovascular health problems (Collins 1986). Poor indoor air quality has been linked with asthma and other chronic respiratory diseases (Krieger and Higgins 2002; Bonnefoy 2007; Jacobs et al. 2009). Furthermore, poor housing and adverse health conditions are exacerbated in contexts of armed conflict. Evidence from war zones shows that armed conflicts lead to a range of direct and indirect adverse health conditions (Pederson 2002). Roberts and colleagues report that deprivation of basic services and supplies, and exposure to traumatic events such as war had a negative impact on the physical and mental health of internally displaced persons in northern Uganda (Roberts et al. 2009). Often people are displaced to overcrowded settlements or neighborhoods that have poor sanitation, water services, electricity and housing quality, conditions that may increase the occurrence of diseases (Ghobarah et al. 2004; Shaw 2004). The health impacts of conflict are very likely to linger for long periods after the conflicts cease (Ghobarah et al. 2004).

Lebanon has suffered from protracted civil conflict (1975–1990) and from Israeli invasions in 1978, 1982 and 2006. Wars have resulted in damaged infrastructures and severe social, economic and health impacts. Furthermore, wars have led to the displacement of approximately 1 million people, of which 450,000 have been displaced internally (USCRI 1999). Most of the internally displaced people have settled in urban areas. Internal displacement compounded with rapid urban growth has led to the formation of a number of informal and unregulated settlements on the outskirts of the capital, Beirut (UN 2008). This article investigates the association between internal displacement, housing quality and reported chronic diseases in a low-income neighborhood located on the outskirts of Beirut, Lebanon. It considers the health consequences of war-related internal displacement and poor housing conditions.

Context

The study was undertaken in the neighborhood of Nabaa in eastern Beirut, a densely populated urban area that has grown exponentially on the edge of the capital city. The neighborhood has an estimated population of about 12,000, with one-third being internally displaced from other parts of the country (Makhoul et al. 2003). It falls under two municipal authorities: Bourj Hammoud and Sin El-Fil. It is the nearest settlement to Municipal Beirut and is only 5 km from the city's business district (see Fig. 1). Drawing the borders of the area is problematic because of the lack of clear municipal zoning of neighborhoods and quarters. Although geographic and physical boundaries are blurred, it

is socially well defined as a low-income, densely populated and working class area at the edge of the city center. The neighborhood has an additional feature associated with war-related displacement. The neighborhood has housed waves of internally displaced people.

The area was originally agricultural and comprised of marshland at the eastern bank of the Beirut River. The land is mostly owned by Christian families from the village of Sin el-Fil and nearby villages who use it for farming. Christians settled in the area in the mid-nineteenth century, migrating from villages in Mount Lebanon (Khater 2001). The presence of the Maronite Kahale family in Sin El-Fil, for example, dates to 1860; they originated from the Aley district in Mount Lebanon.

In 1926, however, a major change in the local fabric took place when Armenian refugees, who fled persecution in Turkey, moved to settle in the area with the help of French Mandate authorities and charities. The Armenians, estimated at 10,000 migrants, were relocated from temporary camps to permanently and purposely built houses on the western side of the area, which became known as Bourj Hammoud (Sharara 1998; Fawaz and Peillen 2003). In 1939, with the arrival of another wave of Armenian refugees from Alexandretta (South Turkey), more houses were built and the area extended further.

The 1940s and 1950s saw another wave of newcomers from peripheral parts of Lebanon. With the acceleration of urbanization in the 1940s and growth of Beirut as the country's main economic and political center, the area attracted waves of low-skilled rural migrant job seekers, especially Shia Muslims. Many of the Shias moved from villages and towns of South Lebanon in the wake of the 1948 Israeli-Arab war that led to cutting the economic ties between Southern Lebanon and Mandate Palestinian cities.

Over time, the neighborhood emerged as a confessionally mixed working class area housing waves of economic migrants, refugees and internally displaced people. Until the mid-1970s, the area was populated with Shia Muslims, Armenian Christians and Maronite Christians. But with collective violence erupting in 1975–1977 (El-Khazen, 2000), the communal fabric of the area underwent a major change. Civil war led to the displacement of almost all the Muslim population from the neighborhood. Conversely, Christians who were displaced from other parts of the country moved into the neighborhood, replacing Muslim residents. The change in the communal demographics of the area persisted even after the end of the civil war in 1990.

Housing conditions in Nabaa

The rapid growth of the neighborhood was a result of the surge in housing demand as waves of refugees, internally

Fig. 1 Eastern suburbs. The Beirut River acts as the border between municipal Beirut and the eastern suburb. Nabaa is within the blue line. Source: Municipality of Beirut website



displaced and rural migrants were attracted to Nabaa because of its proximity to industrial plants and Beirut’s business district. Indeed, the affordability of land and housing due to the unregulated urban system was central in luring newcomers. The land was bought in small parcels, and dwellings were hastily built by those who had some savings in an attempt to make a quick profit from the housing demand. The size of the newly built apartments was between 100–150 m². Buildings were between two or three floors high, and ground floors were usually left for commercial and industrial purposes and were used as grocery shops, shoemaking shops or car repair centers (see Figs. 2, 3, 4). Although building permits were obtained from the municipal authorities, the buildings were poorly constructed with precarious housing and environmental conditions.

Methods

Design and data collection

This study is based on data obtained from the Urban Health Study carried out in 2002 by the Faculty of Health Sciences at the American University of Beirut. A cross-sectional survey design was used in the Nabaa neighborhood. The survey was based on a two-stage probability sample of 1,151 households with 4,987 members of all age groups.

A questionnaire was administered to a proxy respondent from the household in a face-to-face interview. The questionnaire included questions on socio-demographic information and health of participants, as well as household characteristics. The interviewers who administered the

Fig. 2 Image of mixed housing and industrial use; residential units above car repair work-shops in Nabaa



questionnaires were thoroughly trained on individual questions. The instrument was pilot tested to insure respondents' proper understanding of all questions.

Ethical approval for the study was granted by the Institutional Review Board at the American University of Beirut. All respondents were informed of the objective of the study, and oral consent was obtained. The overall response rate was 83.4%.

Measures

Demographic and socioeconomic characteristics

The sociodemographic economic variables such as age and gender of each household member, as well as measures of educational attainment of head of household/spouse and monthly income, were included in the analysis. Age of



Fig. 3 Narrow streets in Burj Hammoud-Sin el Fil



Fig. 4 A main road in Burj Hammoud-Sin el Fil

respondents was subdivided into three categories: youth (0–17 years), adults (18–59 years) and older adults (60+ years). The educational attainment was estimated using the maximum number of years recorded for the head of the household or his/her spouse; it was then divided into three groups: elementary or less, primary-intermediate, and secondary or above. The household income, measured as total monthly income in thousands of Lebanese pounds (LBP), was divided into six groups: <450,000 LBP (<\$US 300); 450,000–<750,000 LBP (US\$ 300–<500); 750,000–<1,000,000 LBP (\$500–<667); 1,000,000–<1,200,000 (\$667–<800); 1,200,000–<2,000,000 (\$800–<1,333); $\geq 2,000,000$ (\geq \$1,333). Furthermore, displacement was measured by asking respondents whether or not they had ever been displaced (yes or no).

Measurement of crowding was calculated by dividing the number of people living in each household by the number of rooms in the dwelling. Households were divided into two categories: moderately crowded with two persons or less per room and highly crowded with more than two persons per room. All rooms in the dwelling were counted except the kitchen, bathroom, unclosed balconies and garages.

Measures of housing quality

This study used indicators of housing quality that measure infrastructure and services in addition to housing conditions. The infrastructure and services index comprised six items that included: cuts in electrical power for more than 4 h/day, problems with the reliability of electrical power, problems with the timing of garbage collection, problems with garbage disposal, problems with sewage disposal and rainwater flooding. An item regarding drinking water was excluded from the calculation because all households reported access to potable water. The housing conditions index included 15 items regarding pest infestation, lighting, natural ventilation, heating, presence of humidity, and cracks in walls and ceiling (see Table 3). The perception of residents, who are well aware of the environmental conditions of their households and neighborhood, was used to assess the quality of infrastructure, services and housing conditions.

All the items in both indices were dichotomized such that zero denoted the absence of a problem and one denoted its presence. The number of problems were tallied and reflected in a score ranging from 0 to 15 problems for the housing conditions index and 0 to 6 for the infrastructure and services index.

Outcome measure

Reported chronic illness was the outcome of interest in this study. The indicator was dichotomized into ‘zero,’ denoting

the absence of chronic illness, and ‘one,’ indicating its presence. A proxy respondent reported on chronic illnesses prevalent among household members using a checklist included in the questionnaire. They also provided additional information on other illnesses where applicable. Chronic illnesses were classified and identified using the 10th revised edition of the International Classification of Diseases (WHO 1992).

Statistical analysis

Sample characteristics, such as demographic variables, type of reported illnesses and housing quality indices were summarized using means and standard deviations for continuous variables and frequency distributions for categorical variables. These variables were also compared between those who were ever displaced and those who were not using the chi-square test, Fisher’s exact test when cell counts were less than five and t-test for continuous variables (Infrastructure and Services Index and Housing Conditions Index). We used a multiple regression model to study the simultaneous effect of displacement and housing quality on reported chronic illness, adjusting for possible confounders such as demographic variables. The generalized estimation equation method was used to account for correlations among people living in the same household. This was done by including all variables that were significant ($p \leq 0.05$) at the bivariate level. Adjusted odds ratios (OR) and corresponding 95% confidence intervals were reported. All analyses were done using STATA (version 10, College Station, TX). Significance was set at the 5% level.

Results

Sociodemographics and health profile

Basic sociodemographics of the sample population ($N=4,987$) in Nabaa are summarized in Table 1. Residents in Nabaa were predominantly Lebanese (91.3%), with a mean age of 30 ($SD \pm 19.7$, range 0–97 years) and gender ratio of 1. Over half (55%) of the residents were single, and 38% reported being married. Over a third (35%) of residents reported having ever been displaced. As for the place of origin, the majority (80%) of residents reported originating from outside the Beirut area. For most of the residents, the places of origin were Mount Lebanon (34%) and Bekaa (17%). Only 46% of those aged 15 years or more were involved in the labor force. Over half (59%) of the residents earned less than 1,000,000 LBP (US\$ 667) a month. Nearly two-thirds of the residents reported low educational attainment: 68% had elementary educa-

Table 1 Sociodemographic characteristics of study participants (N=4,987, Nabaa 2002)

Independent variable	N	Percentage
Study population	4,987	100
Age		
<18	1,572	31.5
18–59	2,895	58.1
60+	519	10.4
Mean age (SD)	30.27±19.74	
Gender		
Male	2,485	49.8
Female	2,502	50.2
Marital status		
Single	2,720	54.6
Engaged	67	1.3
Married	1,905	38.2
Widowed	231	4.6
Divorced/separated	61	1.2
Nationality		
Lebanese	4,551	91.3
Other (Palestinians: n=69)	436	8.7
Place of origin		
Beirut	596	12.0
Mount Lebanon	1,669	33.5
North Lebanon	560	11.2
South Lebanon	558	11.2
Bekaa	856	17.2
Nabatieh	358	7.2
Other countries	390	7.8
Place of origin (re-categorized)		
Beirut Governorate	596	12.0
Other Lebanese governorates	4,001	80.2
Other countries	390	7.8
Income level		
<450,000	180	18.0
450,000–<750,000	272	27.3
750,000–<1,000,000	135	13.5
1,000,000–<1,200,000	111	11.1
1,200,000–<2,000,000	221	22.1
≥2,000,000	79	7.9
Ever displaced		
Yes	1,736	34.8
No	3,240	65.0
Do not know	11	0.2
Highest educational level of head of household/spouse		
Elementary or less	782	68.4
Primary-intermediate	209	18.3
Secondary or more	152	13.3
Labor force participation ^a		
No	1,727	46.4
Yes	1,991	53.6
Household crowding		
Two persons or less in a room	2,987	60.1
More than two persons in a room	1,985	39.9

^a Limited to members aged ≥15 years old

tion or less, 18% had primary-intermediate, and only 13% had secondary or more. As for crowding, 40% of the residents lived in households with more than two persons per room.

Around 20% of residents reported suffering from a chronic illness (Table 2). The main chronic illnesses reported were circulatory (27%), endocrine nutritional and metabolic (20%), musculoskeletal (14%) and respiratory (13%).

Housing quality indices

Table 3 shows the proportion of households that reported problems in their housing quality. The most common reported problems relating to infrastructure and services were power cuts (46%) followed by problems with sewage disposal (31.5%), unreliability of electrical power (24.1%), and problems with garbage disposal (21%) and garbage collection (19%). Only 9% of the households reported problems due to rainwater flooding. The most prevalent problems related to housing conditions were poor ventilation (90%), cockroach infestation (72%), lack of a main source of heating (71%), seepage in walls (64%) and ceilings (42%) and humid conditions (59%). Nearly half (45%) of the households reported cracks in the walls.

Sociodemographics and displacement

Table 4 presents the sociodemographics of the displaced group (N=1,736) compared to the non-displaced group (N=3,240). The displaced group was older, with a majority (73%) aged between 18 and 59 years old, whereas only 50% of the non-displaced persons were in this age group. Nearly one in five persons (18%) of the displaced group was above 59 years of age as compared to only 6.5% of the non-displaced. There were no differences in gender proportions in both groups. The majority (97%) of the displaced were Lebanese. The study participants' places of origin were mainly Mount Lebanon (38%), Bekaa Valley (20%) and South Lebanon (15%). No differences related to the labor force were found between the displaced and non-displaced groups. Overall, the income level for both groups was similar. Nearly 42% of the non-displaced group lived in households with more than two persons in a room compared to 37% for the displaced group. Finally, on average the displaced groups reported a significantly lower number of problems with infrastructure and services (1.47 vs. 1.57 for displaced and non-displaced groups, respectively) but a higher number of problems with housing conditions (6.54 vs. 6.23 for displaced and non-displaced groups, respectively).

Table 2 Type of reported illnesses among study participants (Nabaa, 2002)

Independent variable	<i>N</i>	Percentage
Reporting a chronic illness		
Yes	966	19.4
No	4,021	80.6
Total number of individuals	4,987	100
Number of reported chronic illnesses per household		
0	526	45.7
1	376	32.7
≥ 2	249	21.6
Total number of households	1,151	100.0
Type of reported chronic illnesses		
Neoplasms	9	0.9
Diseases of the blood	33	3.4
Endocrine nutritional and metabolic diseases	188	19.5
Mental and behavioral problems	9	0.9
Nervous system	77	8.0
Diseases of the eye	11	1.1
Diseases of the ear	2	0.2
Diseases of the circulatory system	265	27.4
Diseases of the respiratory system	124	12.8
Diseases of the digestive system	51	5.3
Diseases of the skin and subcutaneous tissue	6	0.6
Diseases of the musculoskeletal system	135	14.0
Diseases of the genitourinary system	36	3.7
Symptoms, signs of abnormal clinical and laboratory findings	13	1.3
Not specified	7	0.7
Total number of reported chronic illnesses	966	100.0

Association between housing quality indices and chronic illnesses

Results of the multiple logistic regression model (Table 5) demonstrated that reporting chronic illness increased significantly with displacement, the number of infrastructure and housing problems, age, and gender, whereas it decreased significantly with household educational attainment. Residents who are 60 years of age and over were 24 times more likely to report chronic illnesses compared with those aged less than 18 years (OR=24.61, 95% CI 18.07–33.52). Similarly, female residents were 40 percent more likely to report a chronic illness than males (OR=1.40, 95% CI 1.21–1.63). Individuals who had ever been displaced were 44 percent more likely to report a chronic illness than those who had never been displaced (OR=1.44, 95% CI=1.21–1.73). Households with a head or spouse with a secondary education or more were 28 percent less likely to report chronic illness than households with a head or spouse with only an elementary education (OR=0.72, 95% CI 0.53–0.98).

For each additional problem reported concerning the infrastructure and services, the presence of illness increased by 9% (OR=1.09, 95% CI 1.01–1.18). Similarly, for each

additional problem reported in housing conditions, the presence of illness increased by 5% (OR=1.05, 95% CI 1.02–1.09). No significant association was found between the presence of chronic illnesses and crowding conditions.

Discussion

The study investigated the association between the domestic environment, internal displacement and prevalence of chronic illnesses in a low-income urban neighborhood on the outskirts of Beirut. One fifth of the population reported suffering from chronic diseases, including circulatory, endocrine, nutritional and metabolic illnesses, in addition to musculoskeletal and respiratory problems. We found a strong positive association between housing quality and the occurrence of chronic illnesses. This result echoed findings of other studies carried out in Lebanon in the suburb of Hay el Sellom, the largest informal settlement in Beirut (Habib et al. 2009), and in Palestinian refugee camps in Lebanon (Habib et al. 2006; Zabaneh et al. 2008). Furthermore, we found higher rates of chronic illnesses reported among females, older people and internally displaced individuals. Moreover, residents that had

Table 3 Frequency distribution of the housing quality indices (Nabaa, 2002)

	No. of households reporting presence of a problem	Percentage
Measures of infrastructure and services		
Cuts in electrical power for more than 4 h/day	531	46.1
Problems with sewage disposals	362	31.5
Problems with garbage disposal	243	21.1
Problems with the reliability of electrical power	277	24.1
Problems with timing of garbage collection	221	19.2
Rainwater flooding	108	9.4
Measures of housing conditions		
Poor ventilation	1,030	89.5
Cockroach infestation	833	72.4
Absence of a main source of heating	812	70.5
Presence of seepage in walls	741	64.4
Presence of humidity	682	59.3
Presence of cracks in walls	513	44.6
Presence of seepage in ceiling	480	41.7
Lack adequate natural sunlight in bedroom	336	29.2
Lack adequate natural sunlight in living room	300	26.1
Presence of cracks in ceiling	317	27.5
Presence of broken windows	258	22.4
Presence of water overflow from floor drains		
Always	52	4.5
Most of the time	34	3.0
Sometimes	169	14.7
Mice infestation	264	22.9
Rat infestation	133	11.6
Presence of exposed electrical wires	150	13.0

high educational attainment were less likely to report a chronic illness than those that had elementary education or less.

Domestic environment and health

In accordance to findings of previous studies, our analysis showed a positive association between problems in infrastructure and services and the prevalence of chronic illnesses (Bitran et al. 2003; Leipziger et al. 2003; Bailie and Wayte 2006). The most prevalent reported problems in infrastructure and services, relating mainly to electrical power and sewage and garbage disposal, were an expected result. As a result of the civil war, power cuts have been common throughout the country, with increased frequency in impoverished areas (Habib et al. 2006, 2009). Some households rely on private electricity services operated by local electrical generators, adding a financial burden to the household (Fawaz 2008; Habib et al. 2009). Moreover, limited investment in proper sewage networks has led to sewage overflow in underserved areas. Similarly, garbage collection and disposal services have not been satisfactory in low income neighborhoods, leading to quick over-piling of solid wastes on street corners.

In addition to infrastructure-related problems, residents suffered from poor housing conditions such as poor ventilation, cockroach infestation, seepage, humidity and lack of heating. Our analysis showed a positive association between housing conditions and the presence of chronic illnesses in the study population. It has been reported that poor ventilation increases the interior moisture of the house, resulting in a thriving environment for pests such as cockroaches, which have been linked to human respiratory diseases (Krieger and Higgins 2002).

Although 40% of the households in Nabaa reported living in crowded conditions with more than two persons per room, the regression analysis did not show an association between household crowding and the presence of chronic illness. This result can be attributed to the high collinearity between the measure used for crowding conditions and housing conditions ($p < 0.001$) and infrastructure and services ($p < 0.001$).

Displacement and health

Our findings showed that the displaced group was older and had lower educational attainment than the non-displaced

Table 4 Sociodemographics of the displaced group as compared to the non-displaced group (N=4,987, Nabaa, 2002)

Variables	Displaced N (%)	Not displaced N (%)	P-value
Age			<0.001
<18	168 (9.7)	1,404 (43.2)	
18–59	1,258 (72.5)	1,637 (50.4)	
60+	309 (17.8)	210 (6.5)	
Gender			0.286
Male	883 (50.9)	1,602 (49.3)	
Female	853 (49.1)	1,649 (50.7)	
Nationality			<0.001
Lebanese	1,685 (97.1)	2,866 (88.2)	
Other	51 (2.9)	385 (11.8)	
Place of origin			<0.001
Beirut	139 (8.0)	457 (14.1)	
Mount Lebanon	658 (37.9)	1,011 (31.1)	
North Lebanon	148 (8.5)	412 (12.7)	
South Lebanon	262 (15.1)	296 (9.1)	
Bekaa	341 (19.6)	515 (15.8)	
Nabatieh	159 (9.2)	199 (6.1)	
Other countries	29 (1.7)	361 (11.1)	
Labor force participation*			0.055
No	907 (55.3)	1,084 (52.1)	
Yes	733 (44.7)	995 (47.9)	
Highest educational level of head of household/spouse			0.009
Elementary or less	1,227 (71.2)	2,169 (67.0)	
Primary-intermediate	295 (17.1)	616 (19.0)	
Secondary or more	202 (11.7)	453 (14.0)	
Income level			<0.001
<450,000	185 (12.4)	406 (14.1)	
450,000–<750,000	333 (22.4)	738 (25.7)	
750,000–<1,000,000	189 (12.7)	399 (13.9)	
1,000,000–<1,200,000	173 (11.6)	341 (11.9)	
1,200,000–<2,000,000	393 (26.4)	733 (25.5)	
≥2,000,000	216 (14.5)	254 (8.8)	
Household crowding			0.001
Two persons or less in a room	1,097 (63.2)	1,890 (58.4)	
More than two persons in a room	639 (36.8)	1,346 (41.6)	
Variables	Displaced mean (SD)	Not displaced mean (SD)	P-value
ISI	1.47 (1.24)	1.57 (1.24)	0.004
HCI	6.54 (2.68)	6.23 (2.75)	<0.001

* More than 15 years old

group, indicating that the older generation did not return to their place of origin after the civil strife had ended. Furthermore, the displaced group reported more problems related to poorer housing conditions than their non-displaced counterparts. Significantly, our study indicated that the displaced group is more likely to suffer from chronic illness compared to the non-displaced. This confirms other studies conducted in war and post-war zones. Choueiry and Khawaja's (2007) assessment of the association between internal dis-

placement and self-reported health of married women in three impoverished neighborhoods in Beirut showed that displaced women reported poorer self-reported health than non-displaced women. Similar studies in Bosnia and Herzegovina, Rwanda and Chechnya show that the displaced stay in camps or temporary settlements for years after conflicts end, often in precarious living conditions affecting their general health status (Ghobarah et al. 2004; de Jong et al. 2007; Schmidt et al. 2008).

Table 5 Multiple logistic regression on the presence of chronic illnesses among study participants (N=4,987, Nabaa, 2002)

Independent variable	Adjusted OR	95% CI	P-value*
Age			
<18	1		
18–59	3.40	2.64–4.40	<0.001
60+	24.61	18.07–33.52	<0.001
Gender			
Male	1		
Female	1.40	1.21–1.63	<0.001
Nationality			
Lebanese	1		
Other	0.77	0.53–1.10	0.185
Ever displaced			
No	1		
Yes	1.44	1.21–1.73	0.002
Highest educational level of head of household/spouse			
Elementary or less	1		
Primary-intermediate	0.88	0.69–1.13	0.316
Secondary or more	0.72	0.53–0.98	0.038
Infrastructure and Services Index	1.09	1.01–1.18	0.028
Housing Conditions Index	1.05	1.02–1.09	0.004
Household crowding			
Two persons or less in a room	1		
More than two persons in a room	0.94	0.77–1.13	0.503

*Significance level was set at 0.05

Limitations

This study has several limitations. First, the cross-sectional design provides only descriptive relationships between variables rather than causal. Second, the current study did not include mental health evaluations of the internally displaced residents, which may be necessary, as Karam et al. (2006) report a greater prevalence of mental disorders among individuals in Lebanon who have been exposed to traumatic events such as war. Research shows that poor housing conditions are linked to negative impacts on mental health and associated with depression among residents (Krieger and Higgins, 2002; Shenassa et al. 2007). Finally, no data was collected on behavioral characteristics of participants, such as smoking, drinking and drug abuse, all of which have been strongly linked to health (Harpham 2009).

Conclusion

This study investigated the association among war-related internal displacement, housing quality and the prevalence of chronic illness in Nabaa, a low-income neighborhood in Beirut. The study shows that reported poor health conditions among residents of Nabaa were associated with poor

housing quality. Moreover, residents that have ever been displaced experience worse living conditions and are more likely to report poor health than those that have never been displaced. This article highlights the lingering impact of armed conflicts on the health of war-affected populations, where the internally displaced in Lebanon still suffer from the effects of civil war twenty years after its end. This article suggests that special attention needs to be given to the internally displaced even after years of peace and settlement, and recommends that municipal authorities give special consideration to the needs of the internally displaced people when planning and implementing basic services. Furthermore, grass-root movements that represent the internally displaced and other marginalized groups should be given a platform to voice their needs when planning and carrying out environmental, public health and social services. Forms of participatory governance at the municipal level could include, but are not exclusive to forming neighborhood committees, neighborhood forums and issue-based groups.

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