Comparison of pethidine and tramadol for pain relief after a caesarean: a randomised controlled trial

Khaled I Abu El-Aish, Haly S Zourob

Background Appropriate analgesia for pain after caesarean is important to aid a mother's recovery. Pethidine and tramadol are used for analgesia during obstetrical procedures, but they have not been compared for relief of post-caesarean pain. We therefore compared the analgesic efficacies and adverse effects of pethidine and tramadol in women after a caesarean.

Methods In a randomised, unmasked, parallel-group controlled trial, we enrolled women (aged 18–41 years) who were undergoing either elective or emergency lower-segment caesarean under general anaesthetic at Al Helal Al Emirati Hospital, Rafah, Gaza Strip, occupied Palestinian territory. Using a manually generated allocation sequence that was independently managed by medical staff, we randomly assigned women to receive a single dose (100 mg) of pethidine or tramadol intramuscularly immediately after the caesarean. We used a visual analogue scale (VAS; range 0–10, 0=no pain and 10=pain as bad as it could be) to record the pain 1 h after the start of the analgesia and then at 6 h, 12 h, and 24 h (primary outcome). The secondary outcomes were nausea and vomiting scores (NVS 0–3; 0=no nausea or vomiting and 3=severe, unresponsive to antiemetic drugs), sedation scores (SS 0–3; 0=patient awake and 3=severe sedation, patient difficult to rouse, unrousable), and time to pass first flatus. Another secondary outcome was the use of other analgesic drugs during 24 h. Data were analysed with SPSS (version 13.0). We compared the groups using the Mann-Whitney *U* test, student's *t* test, or χ^2. The study was approved by the Ministry of Health and Helsinki Committee, Gaza Strip. Women provided verbal informed consent before their participation in the trial and consent to undergo a caesarean.

Findings We screened 258 women and enrolled 232 (mean age 29·5 years [SD 7·3]); 26 women were excluded because they had spinal or epidural anaesthesia. 116 women were allocated to each of the two treatment groups. Greater analgesia was achieved with pethidine at 1 h and 6 h than with tramadol (VAS: 1 h, mean score 2·91 *vs* 5·10, p=0·003; 6 h, 2·97 *vs* 3·52, p=0·049). No differences were noted in the proportion of patients in the pethidine and tramadol groups with NVS 0 at 1 h, 6 h, 12 h, and 24 h after caesarean (102 [88%] of 116 *vs* 99 [85%] of 116, p=0·555; 108 [93%] *vs* 105 [91%], p=0·633; 111 [96%] *vs* 112 [97%], p=1·00; and 114 [98%] *vs* 113 [97%], p=1·00, respectively). Mean time to first passage of flatus was 12·6 h (SD 5·0) and 13·3 h (5·1) in the pethidine and tramadol groups, respectively (p=0·376). More patients in the tramadol group had slight sedation (SS 1) than did those in the pethidine group at 12 h and 24 h (16 [14%] *vs* five [4%], p=0·014; and seven [6%] *vs* one [<1%], p=0·036, respectively). The total intake of other non-narcotic analgesic drugs was greater in the tramadol group than in the pethidine group (99 [85%] of 116 *vs* 87 [75%] of 116 patients; p=0·048).

Interpretation Pethidine was more effective than was tramadol for post-caesarean pain relief. We therefore recommend that it is used to relieve pain after a caesarean.

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KIAE-A contributed to the conceptualisation of the study. KIAE-A and HSZ developed all the study processes, completed the analyses, and wrote the Abstract.

Conflicts of interest
We declare that we have no conflicts of interest.

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Access to care for women reporting postnatal complications in the occupied Palestinian territory: a cross-sectional study

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Background **Postnatal care is an important component of maternal health, especially for the treatment of complications after delivery. However, only a third of women receive postnatal care in the occupied Palestinian territory (oPt). The aim in this study was to assess the factors that contributed to women not receiving postnatal care despite the manifestation of symptoms.**

Methods **Data were obtained from a nationally representative household survey (Pan-Arab Project for Family Health [PAPFAM] 2006) by the Palestinian Central Bureau of Statistics, West Bank, oPt, and analysed. Women (aged 15–54 years) who were married and reported one or more postnatal symptoms with fever—severe vaginal bleeding, swelling and pain in the legs, foul-smelling vaginal discharge, lower abdominal pain, severe lower back pain, severe upper back pain, painful micturation, or breast swelling and pain—were selected from 3334 women in the postnatal period. For the analysis, responses about these eight symptoms were converted into a scale (Cronbach's α=0·82). Descriptive analysis, Pearson's χ^2, and binary logistic regression were done with postnatal care as the dependent variable and selected demographic and socioeconomic variables as possible associated factors. SPSS (version 17.0) was used for the statistical analysis.**

Findings **267 (46%) of 584 women had one postnatal symptom, 217 (37%) had two or three postnatal symptoms, and 100 (17%) had four to seven. 245 (42%) women received postnatal care and 339 (58%) did not. 251 (74%) of 339 women who did not receive postnatal care reported that symptoms were not a problem. Logistic regression analysis showed that women who were poorer were more likely to not receive postnatal care than were those who were better off (odds ratio 2·1, 95% CI 1·1–4·0]. Women reporting normal delivery were four times less likely to use postnatal care than were those who reported having a caesarean (4·0, 2·5–6·2). Women married to younger men (aged ≤29 years) and women living in the West Bank were almost half as likely to receive postnatal care than were women married to older men (aged ≥30 years; 1·9, 1·1–3·3) and women in the Gaza strip (2·4, 1·5–3·6).**

Interpretation **Poverty is an important barrier to postnatal care for women and contributes to the inequity in the provision of services to these women. Better accessibility of postnatal care for women in the Gaza Strip might be due to the presence of several international humanitarian agencies that provide services to people living in this region, and the small size of the Gaza Strip increasing accessibility to clinics for women. More efforts are needed to address women's health needs in the postnatal period.**

Funding **None.**

Contributors

All authors participated in defining the research question and analysing the results, under the supervision of RGi, with statistical support from RGh. HAAN wrote the draft of the Abstract. All authors commented on the draft and approved the final version for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

Midwives' and women's views of childbirth in the Gaza Strip, occupied Palestinian territory: an exploratory study

Itimad Abu Ward

Background In a quality-of-care assessment of mothers and newborn babies in maternity units in the Gaza Strip, occupied Palestinian territory (oPt), WHO oPt identified poor management of normal childbirth, early discharge, and lack of privacy for women as challenges for the delivery of care to pregnant women. The Palestinian Ministry of Health agreed that these challenges could be addressed by the introduction of a midwifery-led model of care. The aim of this study was to solicit the views of staff and women who had been through childbirth with respect to the introduction of the midwifery-led model of care.

Methods Six focus groups were organised and each group consisted of eight to 12 health professionals (midwives, nurses, or doctors). Selection criteria for the health professionals were experience in midwifery-led model of care and working in a maternity unit of one of the main hospitals in the Gaza Strip. Two focus groups had midwives, two had male and female obstetricians, one had nurse managers, and one had primary health-care midwives and doctors. Three other focus groups were formed with women who had given birth at any time in their lives. Thematic analysis was used to identify themes and subthemes to form the basis for the analysis, and NVivo (version 8) was used to code and emerge themes and subthemes. The Ministry of Health provided the approval to do the study. All participants provided verbal informed consent.

Findings Midwives stated that they lacked training in evidence-based practice. The consensus opinion of the doctors was that normal childbirth is the responsibility of midwives, and they mentioned that the midwives needed training. Managers stated that midwives with a postgraduate education could cope with the increased responsibility, but new graduates needed additional training. Professionals working in primary health care recommended better documentation in the mother–child handbook. Most women said that they preferred women to care for them during childbirth; however, they could not differentiate between midwives and female doctors, and claimed they were not kept well informed about progress and did not have sufficient support during childbirth.

Interpretation Before the midwifery-led model of maternity care can be introduced in the Gaza Strip, midwives need to be given additional training so that they can focus on their core responsibility. The health-care system will assist midwives to respond to these challenges to improve the continuity of care.

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I declare that I have no conflicts of interest.

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Diagnosis of new cases of β-thalassaemia major after prenatal testing: a cross-sectional survey

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Background Thalassaemia is a genetic illness that is prevalent in the occupied Palestinian territory (oPt), and about 4% of the population have the affected gene. People with thalassaemia have hormonal disturbances, delayed growth, and other complications that can lead to financial and social problems for families. We identified the factors that contributed to a family's decision to abort or not abort a fetus affected by β thalassaemia in the West Bank, oPt.

Methods From 2001, the Thalassemia Patients' Friends Society (TPFS) and the Ministry of Health (MoH), both in the West Bank, identified pregnant women who previously had a baby with β-thalassaemia major and therefore might be at risk of having another baby with this disorder. In the oPt, before marriage, couples are required by law to have a thalassaemia screening test—records are available from TPFS and MoH—and if the man and woman are diagnosed as having the trait for the disease they are advised to not get married. However, if they choose to get married, they are warned and given counselling about the possibility of having children with thalassaemia. From January to March, 2011, convenient sampling was used to select 32 women (72 fetuses) in the West Bank who had prenatal screening tests between 2000–11. Two medical students with training in research methods and data gathering interviewed these women after the pregnancy in private settings with a questionnaire that included items about prenatal testing, test results, pregnancy outcome (abortion or birth), and factors affecting a family's decision of whether to terminate the pregnancy. Quantitative data were analysed with SPSS (version 17.0) and qualitative data were analysed manually. The institutional review board at An-Najah National University, West Bank, provided approval to do the study. Women provided written informed consent.

Findings The results of prenatal screening showed that 16 (22%) of 72 fetuses were not carriers of the β-thalassaemia major gene, 36 (50%) were carriers, and 20 (28%) were affected. 17 (85%) of 20 affected fetuses were aborted and three (15%) were not. Two of three families did not have the pregnancy terminated because of their religious beliefs, and the third family did not terminate the pregnancy because they wanted to have a child. 12 (71%) of 17 fetuses were aborted because the families did not want a child with β thalassaemia since they had affected family members, and five (29%) because of disease awareness programmes. A mother's higher education was significantly associated with the choice to abort (five [42%] of 12 mothers with a bachelor's degree did not have an abortion compared with seven [58%] with a high-school education; $p<0·05$).

Interpretation Prevention of new cases of β thalassaemia might be difficult because of some couples' religious views about abortion. We therefore recommend that prominent Palestinian religious authorities agree on a ruling about abortion with respect to fetuses affected by β thalassaemia. Improvement of women's education might reduce the incidence of β thalassaemia. Programmes to raise awareness about β thalassaemia and its complications are needed to reduce the number of new cases of the disease in the oPt.

Funding TPFS.

Contributors
HAS wrote the Abstract and participated in the statistical analysis. AH participated in writing the first draft of the Abstract and the statistical analysis. LAG and BK participated in writing the first draft of the Abstract. AD did the proofreading. All authors have seen and approved the final version of the Abstract for publication.

Conflicts of interest
We declare that we have no conflicts of interest.

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Cognitive caregiving for parents in the occupied Palestinian territory: a cross-sectional survey

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Background Children younger than 5 years represent 14·7% of the Palestinian society. Parenting is important for child development, so various organisations have focused on identifying protective and risk factors related to parenting and child development. The cognitive caregiving behaviour of Palestinian parents with children younger than 5 years in the occupied Palestinian territory (oPt) was assessed.

Methods The Palestinian Family Health Survey 2006, Palestinian Central Bureau of Statistics, Ramallah, West Bank, oPt, included three questions about whether family members had read books or stories to or helped children with drawing during the 3 days preceding the survey. A cognitive caregiving scale was constructed from questions used to identify whether either of the parents had engaged in such activities with good internal consistency (α 0·76). The scale was recoded as no activity and at least one activity. χ^2 testing was used to check for significant associations of cognitive caregiving with each variable—region, locality, mother's age, parent's education and relation to labour forces, child's sex, and family's wealth status. Binary logistic regression was done to identify confounders. Data were analysed with SPSS (version 17.0).

Findings 5352 households were visited for the survey: 3051 (57%) from the West Bank and 2301 (43%) from the Gaza Strip, oPt. Mothers in 1869 (35%) households had greater than high-school education. 2298 (43%) households were classified as poor, 2224 (42%) middle class, and 830 (16%) better off financially. 2962 (55%) parents did not practice cognitive caregiving. Logistic regression analysis showed that children in better-off (odds ratio 1·29, 95% CI 1·08–1·52) and middle-class families (1·20, 1·06–1·35) were more likely to receive cognitive caregiving from their parents than were children from other families. Children with educated mothers (>12 years of education) were more likely to receive cognitive caregiving than were those whose mothers had less education (1·45, 1·28—1·64). Parents in the Gaza Strip were less likely to engage in cognitive caregiving than were those from the West Bank (0·85, 0·76–0·95).

Interpretation The findings suggest that children from the Gaza strip, from poor families, or with less educated mothers need more cognitive caregiving. Training, support, and awareness programmes are needed for parents of these children to improve cognitive caregiving for them in the oPt.

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Contributors

NAA-S, RHE-S, NMG, NSK, and RGh contributed to the conceptualisation of the Abstract under the supervision of RGi and NMEA-R. NAA-S, RHE-S, NMG, and NSK contributed to the analysis of data under supervision and with support by RGh. NAA-S drafted the Abstract and all authors read and commented on it.

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Emergency preparedness and response of the Palestinian health system to an Israeli assault on the Gaza Strip, occupied Palestinian territory, in 2012: a qualitative assessment

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Background Although the Gaza Strip, occupied Palestinian territory, has been subjected to repeated Israeli assaults, its health system preparedness and response to emergency situations have rarely been assessed. The response of the health system to the Israeli assault on the Gaza Strip during Nov 14–21, 2012, was assessed.

Methods Data were gathered through review of documents, participants' observations, in-depth interviews with nine health providers, and a focus group of key informants to discuss the performance of the health system in response to the Israeli military attack during Nov 14–21, 2012. Written transcripts were analysed with an emerging-themes method. A series of discussion meetings were held to triangulate the findings. We obtained verbal informed consent from participants and health providers.

Findings The violent events of past decades have affected the capacities and vulnerabilities of the health system in the Gaza Strip for dealing with emergency situations. Different health stakeholders have improved their preparedness because of their experiences. The health facilities—namely, hospitals—are barely adequate for dealing with the regular situations. Although hospitals increased their capacity during emergency situations by discharging patients and suspending regular operations, the burden of casualties was not equitably distributed between them. Not all primary health-care services were operational during the attacks, implying that the delivery of health services, in the event of wider assaults, could be a challenge. The capacity and the performance of human resources in response to most of the emergencies were adequate, making it possible to overcome various logistical deficiencies, inadequate training, and suboptimal organisation of work.

Interpretation The latest assault on the Gaza Strip showed that the emergency preparedness of the Palestinian health system had improved compared with that during previous assaults. This improved preparedness, however, still has shortcomings that could be addressed with further interventions. However, the focus on the Palestinian health system increasing its capacity and reducing its vulnerability is of little use and a short-term solution. The best form of preparedness for an avoidable emergency is to stop the Israeli violence and end the isolation of the Gaza Strip through international efforts.

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Contributors

MA initiated the design of the assessment, interviewed the health providers, transcribed the interviews and focus-group discussions, and wrote the Abstract. GZ interviewed health providers and transcribed the interviews. AY moderated the focus group and contributed to its transcripts. All authors participated in a series of discussion meetings to triangulate the findings, and read and approved the Abstract for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

Effect of chronic exposure to humiliation on wellbeing in the occupied Palestinian territory: an event-history analysis

Brian K Barber, Clea McNeely, Joseph A Olsen, Carolyn Spellings, Robert F Belli

Background Investigation of the long-term effects of political violence is needed. Patterns of past exposure to political violence since the first intifada were identified in a large sample of adults in the occupied Palestinian territory (oPt) and assessed for associations with current adult functioning.

Methods In 2011, fieldworkers from the Palestinian Center for Policy and Survey Research, Ramallah, West Bank, oPt, undertook household interviews in Arabic of a representative sample of 1800 individuals (aged 30–40 years; 50% men) in the oPt. The interviews consisted of a culturally-grounded inventory of current wellbeing or quality of life along with an event-history calendar, which through its design and mode of administration has been shown to enhance memory. For every year from 1987 to 2011, participants indicated the degree from 0 (never) to 3 (frequently) to which they had been shot at, hit or kicked, verbally abused, saw other individuals humiliated, and had their homes raided. Latent profile (MPlus, version 7.0) and general linear regression analyses (SPSS, 21.0) were used for the statistical analyses. All participants provided written informed consent. The Palestinian Center for Policy and Survey Research and the University of Tennessee, Knoxville, TN, USA, provided institutional review board approval for the study.

Findings Data were evaluable for 1758 people. For analyses, yearly scores for violence exposure were averaged within four periods: first intifada, Oslo period, second intifada, and post-second intifada. For men, there were three patterns of past exposure to political violence: 519 (60%) of 872 men reported moderate exposure during the first and second intifadas and very little or no exposure between the intifadas and after the second intifada (group 1); 250 (29%) had the same periodic pattern but with higher exposure during the intifadas (group 2) than did group 1; and 103 (12%) indicated chronic exposure to humiliation (verbal abuse and observing others being humiliated) for all the periods (group 3). For women, there were two patterns of exposure: 745 (84%) of 886 women had the same pattern of low, periodic exposure as did the men in group 1; and 141 (16%) reported high exposure to observing others being humiliated for all the periods, similar to that reported by the men in group 3. Results from the general linear regression models showed that chronically humiliated men and women, compared with other patterns of exposure, had less access to basic resources; higher insecurity or fear; higher feelings of depression; higher feelings of being broken or destroyed; higher trauma-related stress; higher community belonging; and higher marital quality. Chronically humiliated women also reported less personal freedom and poorer health. Post-hoc analyses showed that most of the chronically humiliated participants (85 [83%] of 103 men and 93 [66%] of 141 women) were living in distinct neighbourhoods in East Jerusalem and Hebron—two oPt cities that have a particularly strong presence of Israeli forces, and have frequent and several constraints (including checkpoints and barriers) on the Palestinian population's mobility.

Interpretation The results of this study show that, methodologically, the assessment of the patterns of exposure over time (instead of commonly aggregating exposure) is a useful way to capture the long-term effect of political violence exposure. Substantively, they show the particular risks to long-term wellbeing of individuals with chronic exposure to humiliation.

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Contributors
BKB is the principal investigator and wrote the Abstract. CM and CS edited the Abstract. BKB, CM, and CS supervised the gathering of the data. JAO, CM, and CS did the data analyses. RFB supervised the construction of the event-history calendar.

Conflicts of interest
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Risk factors for cerebral palsy in Palestinian children: a case-control study

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Background Little is known about the risk factors for cerebral palsy in the occupied Palestinian territory (oPt). Indeed, the focus in studies so far has been on developed countries. We therefore assessed known prenatal and perinatal risk factors for cerebral palsy in Palestinian children, and three risk factors specific to Palestinian society—consanguineous marriage, delivery at private maternity homes that lack emergency facilities, and no prenatal doctor visits.

Methods Using questionnaires for the parents of children, we gathered data for prenatal and perinatal risk factors for cerebral palsy between January and August, 2011, and checked information against medical records from the national centre for Palestinian children with cerebral palsy (Jerusalem Princess Basma Center for Disabled Children) for cases and from outpatient clinics for controls. If information differed between the two sources, medical records were favoured. Cases were children who attended the Jerusalem Princess Basma Center for Disabled Children; they were selected by use of convenient sampling. Inclusion criteria for cases were diagnosis of cerebral palsy by a doctor and age younger than 15 years, and for controls any other diagnosis and age younger than 15 years. Controls were every other child attending ten paediatric clinics (UN Relief and Works Agency for Palestine Refugees in the Near East, private, and public) in the West Bank, matched to cases by location. We used SPSS (version 19.0) for logistic regression analyses with estimations of odds ratio and 95% CI. Ethics approval was obtained from all clinics, the Jerusalem Princess Basma Center for Disabled Children, and the Al-Quds University's institutional review board. All parents provided written informed consent.

Findings 107 children were cases (mean age 3·87 years [SD 2·71]) and 223 were controls (4·17 years [3·94]). In cases, the risk of cerebral palsy was highest after caesarean delivery (48 [45%]) and after hypoxia diagnosed by a doctor (49 [46%]). Other important and significant risk factors were low birthweight (25 [23%] cases *vs* 25 [11%] controls; odds ratio 4·6 [95% CI 2·6–8·1]), gestational age (35 [33%] *vs* 32 [14%]; 2·9 [1·7–5·0]), jaundice (20 [19%] *vs* 17 [8%]; 2·7 [1·4–5·6]), multiple births (ten [9%] *vs* two [<1%]; 11·4 [2·5–53·0]), infection during pregnancy (20 [19%] *vs* ten [4%]; 4·8 [2·2–10·9]) and delivery (14 [13%] *vs* ten [4%]; 5·0 [1·5–16·7]), congenital abnormalities (ten [9%] *vs* one [<1%]; 2·4 [1·3–4·4]), and other children with a disability in the family (15 [14%] *vs* four [2%]; 8·9 [2·9–27·6]). New, previously unassessed population-specific factors of significance were consanguineous marriage (51 [48%] cases *vs* 54 [24%] controls; 2·9 [1·8–4·6]), no prenatal doctor visits (12 [11%] *vs* five [2%]; 5·5 [1·9–16·1]), and delivery at private maternity homes lacking emergency facilities (67 [63%] *vs* 85 [38%]; 0·6 [0·3–1·1]). Associations of some risk factors with cerebral palsy remained significant after adjustment for gestation and sex: consanguineous marriage (4·3 [2·2–8·6]) and no prenatal doctor visits (6·6 [1·7–24·9]) but not for delivery at private maternity homes lacking emergency facilities (13 [12%] cases *vs* 43 [19%] controls; 0·43 [0·03–5·30]).

Interpretation Several of the known risk factors are preventable or modifiable. Behavioural changes might enable a reduction in the number of cases of cerebral palsy resulting from consanguinity or an absence of prenatal care and policy changes to regulate private maternity homes in the oPt.

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Contributors
SD designed the study, gathered and analysed the data, and wrote the first draft of the Abstract. LE-K provided intellectual input and supervised the research.

Conflicts of interest
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Integration of mental health-care with primary health-care services in the occupied Palestinian territory: a cross-sectional study

Mustafa El Masri, Dyaa Saymah, Mahmoud Daher, Fuad Al Aisawi

Background Mental disorders are a leading cause of morbidity and disability worldwide. As part of a WHO-led programme to integrate mental health-care with primary health-care (PHC) services, we estimated the baseline prevalence of psychiatric morbidity in governmental PHC clinics in the Gaza Strip, occupied Palestinian territory.

Methods The study sample was recruited from advanced PHC clinics (serving 10 000 people and located in main towns) that were selected by the Palestinian Ministry of Health. One clinic was selected from each of the five districts in the Gaza Strip. Every tenth adult patient attending each of the five clinics was recruited until 100 patients had been recruited from each clinic over 4 weeks. The General Health Questionnaire (GHQ)-12 was completed with a bimodal model of scoring (0-0-1-1, range 0–12, with a cutoff of 3 for caseness) by the 500 adults (280 men; mean age 40·2 years [SD 13·9]) under the supervision of specially trained PHC nurses and then assessed by general practitioners. The patient's physical complaints, diagnosis by a general practitioner, treatment, and referral were then recorded. Moreover, 24 general practitioners were recruited from the five clinics to assess the ability of the patients' general practitioners to detect mental health problems. Binary logistic regression was used to assess the association between caseness on the GHQ-12 and sex, area of residence, age, marital status, education, employment status, chronic medical illness, and number of physical complaints. The diagnoses made by the patients' general practitioners were compared with the findings from the GHQ-12. The Ministry of Health approved the study. Patients provided written informed consent.

Findings 189 (38%) of 500 patients had mental health problems (GHQ-12 score >3). Mental health problems were associated positively with female sex (p=0·016), older age (p=0·027), divorced or widowed marital status (p=0·009), lower education (p=0), unemployment (p=0·003), chronic physical illness (p=0·015), and having several somatic symptoms (p=0). General practitioners were unable to detect psychiatric problems, even in patients who had many risk indicators. No referrals were made to mental health services.

Interpretation The prevalence of psychological distress in adult patients attending the PHC in the Gaza Strip is high compared with rates reported for people in other countries not exposed to conflicts. Our results show inadequate recognition of mental health problems and therefore imply that referral to mental health services is inadequate in PHCs in the Gaza Strip. The Ministry of Health needs to adopt strategies to enable general practitioners to diagnose and treat patients who are in need of mental health care.

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Contributors

MEM participated in the study design, data analysis and interpretation, and writing the final draft of the Abstract. DS participated in the data analysis and interpretation, and editing and writing the final draft of the Abstract. MD participated in designing the study and editing the final draft of the Abstract. FAA participated in designing the study, facilitating data gathering, and editing the final draft of the Abstract. All authors have seen and approved the final version of the Abstract for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

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Determinants of stunting in children younger than 5 years between 2006 and 2010 in the occupied Palestinian territory: a cross-sectional study

Weeam Hammoudeh, Samia Halileh, Dennis Hogan

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Background Stunting, according to WHO's definition, in children younger than 5 years in the occupied Palestinian territory (oPt) increased from 7·2% in 1996 to 10·9% in 2010. However, the rates in the West Bank and Gaza Strip reversed for the first time in 2010, with higher stunting in the West Bank (11·5%) compared with the Gaza Strip (10·4%). The sociodemographic determinants of stunting in the oPt were investigated to understand the possible causes of stunting.

Methods Data were obtained from the nationally representative 2006 and 2010 Palestinian Family Health Surveys (data for 9613 and 8934 children, respectively, included in the analyses). The design of the surveys was similar for the years, with control for sampling weights in the analyses. Logistic regression analyses were used to assess the odds of stunting separately for the 2006 and 2010 surveys. Independent variables in the analysis were sociodemographic, educational, and economic characteristics of the household, and breastfeeding. Odds ratios were adjusted for these variables. Statistical analyses were done with Stata (version 12.1).

Findings The prevalence of stunting in children younger than 5 years in 2006 was 8·5% in the West Bank compared with 15·3% in the Gaza Strip (odds ratio 0·56 [95% CI 0·48–0·66]). In 2010, the prevalence of stunting in the West Bank was 11·9% compared with 10·1% in the Gaza Strip (1·27 [1·08–1·49]). In both surveys, household wealth was a significant predictor of stunting: in 2006 and 2010, children in the richest wealth quintile were 30% (0·70 [0·55–90]) and 32% (0·68 [0·52–90]), respectively, less likely to be stunted than were children in the poorest wealth quintile. Similarly in 2010, we noted that children whose fathers were active in the labour force were 18% (0·82 [0·69–0·97]) less likely to be stunted. Maternal education was a significant determinant of stunting in 2006, with every year of a mother's education associated with a 3% reduction (0·97 [0·94–0·99]) in the likelihood of the child being stunted. In 2010, registered refugee children, irrespective of their residence, were 19% less likely to be stunted (0·81 [0·70–0·95]), and children living in rural areas were 22% less likely to be stunted (0·78 [0·63–0·95]).

Interpretation The results of this study show that there is deterioration in child growth indicators in the oPt, especially in the West Bank between 2006 and 2010, where for the first time stunting is more prevalent than in the Gaza Strip. Household socioeconomic status was an important indicator of child growth in both surveys, and seems to be of greater importance in 2010. Lower odds of stunting in refugee populations might be attributed to the greater availability of services provided by the UN Relief and Works Agency for Palestine Refugees in the Near East, and might be connected to residence in the Gaza Strip (where about two-thirds of the population are refugees). These results need further analysis because the situation in the West Bank and Gaza Strip is volatile and affected by many independent factors such as closures of areas by the Israeli military and the recent Egyptian efforts to close tunnels between Egypt and the Gaza Strip that have been a lifeline for the Gaza Strip during the siege.

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Contributors
WH participated in the conceptualisation of the Abstract, did the analysis, and drafted the Abstract. SH participated in the conceptualisation of the Abstract, assisted in the analysis, and participated in revising the Abstract. DH participated in the conceptualisation and analysis plan, and provided feedback on the drafts of the Abstract.

Conflicts of interest
We declare that we have no conflicts of interest.

Food security and health assessment of vulnerable households in the occupied Palestinian territory: a cross-sectional study

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Background Food is one of the most basic needs for human survival, and access to it is a human right. To increase awareness and improve household income, food security and health status of poor households in the Tubas, Hebron, and Bethlehem governorates, all in the West Bank, occupied Palestinian territory (oPt), were assessed.

Methods The study was done during 2008–10 in consultation with national and international institutions, including the Palestinian Ministry of Agriculture, Ministry of Health, and Food and Agriculture Organization of the UN, all in the West Bank. Several national and local committees were formed by national, regional, and international decision makers, planners, implementers, and donors to empower and direct the project, and support the findings and recommendations through development of national approaches towards sustainable improvement in food security. 3500 households that were poor, according to the food security community committees, were selected from 70 localities for the survey, in which a questionnaire was used to gather data about socioeconomic status, education, and health. Blood samples from 3000 household members who were willing to have blood drawn were tested for concentrations of iron, ferritin, vitamin B_{12}, and albumin, to assess nutritional status. Statistical analyses were done with SPSS (version 13.0). All participants provided verbal informed consent.

Findings The results of the survey showed that members in 1260 (36%) of 3500 households attended school, 210 (6%) attended higher education, 840 (24%) had disabilities (mental or physical), 1820 (52%) had illnesses, and 2065 (59%) had health insurance. 3430 (98%) households reduced their expenditures on food because of their low incomes, 3325 (95%) bought poor-quality food, 2310 (66%) confirmed eating fewer meals per day because they did not have enough food, and 2450 (70%) were dependent on food aid. The results of the blood tests showed that 480 (16%) of 3000 individuals had iron deficiency (<9·5–12·0 g/dL), 900 (30%) had ferritin deficiency (<18 ng/mL), 360 (12%) had vitamin B_{12} deficiency (<208 pg/mL), and 90 (3%) were albumin deficient (<3·5 g/dL).

Interpretation The results indicate that poor households had food insecurity and 24% of the households had members with disabilities. Targeted households were unable to meet their essential needs for food because of the lack of income; lack of employment opportunities, with most individuals relying on jobs in the labour force for Israel; large household size; and high number of disabilities and diseases. The findings from this study were used for radio and television campaigns to raise awareness of food as a basic need and a human right, and to undertake 35 training sessions for local community women in the targeted governorates.

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Contributors
RHE-S, NH, and JI conceptualised the study under the supervision of RG. All authors contributed to the analysis and interpretation of the data and assisted with the literature review and study design. The Abstract was drafted by RHE-S and reviewed by the other authors.

Conflicts of interest
We declare that we have no conflicts of interest.

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Priority setting for prevention and control of coronary heart disease in the occupied Palestinian territory: a pilot study

Rula Ghandour, Rana Khatib, Azza Shoaibi, Simon Capewell, Julia Critchley, Balsam Ahmad, Abdullatif Husseini

Background The burden of coronary heart diseases is increasing at an alarming rate in most low-income and middle-income countries. The findings of evidence-based studies suggest that this burden can be prevented through health policies. Various methods to define and select policies have been developed including evidence-based prioritisation, which is important in view of the scarce resources in and data for low-income and middle-income countries. The aim of this study was to assess and prioritise context-specific policies for the prevention and control of coronary heart diseases in the occupied Palestinian territory (oPt).

Methods In this mixed-methods pilot study, a set of policy options was developed and shortlisted on the basis of integrated findings from country-specific qualitative situational analysis inputs and quantitative modelling of related risk factors and treatments with the IMPACT Excel-based model. A simple Excel sheet was used to calculate a priority score for each policy and then the policies were ranked in terms of their importance. Criteria from WHO's prioritised research agenda and stepwise framework were used to rate the policies. The specific policies were scored and prioritised by five key informants (mid-level health managers, health practitioners, and academics) from the oPt and then ranked in terms of importance. Ethics approval to undertake the study was obtained from the Institute of Community and Public Health, Birzeit University, Ramallah, West Bank, oPt. All participants provided verbal informed consent.

Findings Key informants shortlisted and rated 19 polices. The top five policies were population-level primary prevention with focus on blood pressure (n=2), health-system level with focus on collaboration and capacity building of health-care providers (n=2), and treatment for high-risk patient groups (n=1).

Interpretation Policies with focus on primary prevention and health systems indicate a good understanding of the epidemiology of diseases and the needs of the community. However, the small number and scope of the policy makers (directly related to health) who rated the policies in this study were limitations for improved identification of evidence-based policies. This approach of ranking pre-identified policies might be important for engaging policy makers and, when there are few resources, prioritising policies.

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RG contributed to the study design, did the data analysis, and wrote the first and final drafts of the Abstract. All other authors contributed to the conceptualisation, design, and data analysis, and reviewed and provided comments about the Abstract.

Conflicts of interest
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Incidence and case-fatality rate of meningococcal meningitis and meningococcal septicaemia in the Gaza Strip, occupied Palestinian territory, during 2011

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Background Meningococcal disease is a life-threatening bacterial infection that presents as meningococcal septicaemia or meningococcal meningitis. Meningococcal septicaemia, despite treatment and improvement of the associated case-fatality rate (CFR), is rapidly progressive and can be fatal, whereas meningococcal meningitis usually has a good outcome and is more common than is meningococcal septicaemia (47% *vs* 43%). Meningococcal disease is endemic in the Gaza Strip, whereas it is sporadic in the West Bank, occupied Palestinian territory (oPt). We describe the subtypes of meningococcal disease in the Gaza Strip with respect to age, sex, serotype, and CFR during 1 calendar year (2011).

Methods The five main hospitals providing paediatric services in the Gaza Strip notified the Ministry of Health about all cases of meningococcal disease on diagnosis during 2011. The hospitals used a standard pro forma to provide the ministry with the patients' personal, clinical, and laboratory data. The staff at the Ministry of Health visited these hospitals to gather data and follow up the cases of meningococcal disease by use of questionnaires and by visiting the patient's home to give prophylactic treatment and educational information to all the patient's contacts. We used SPSS (version 13.0) for statistical analysis (descriptive statistics, frequencies, cross tabulations, χ^2, *t* test, one-way ANOVA, SD, and p values).

Findings 151 cases (mean age of 149 cases 4·4 years [SD 3·2], and two cases aged 50 years and 59 years) of confirmed meningococcal disease were reported during 2011: 117 (77%) meningococcal septicaemia and 34 (23%) meningococcal meningitis. Diagnostic tests used were CSF culture (n=26), Gram staining of CSF (n=17), skin smear (n=101), or blood culture (n=6); a diagnostic test was not done for one case, which was diagnosed on the basis of clinical presentation, skin rash, and rapid progression to death. With a population of 1 588 691, the overall incidence was 9·50 per 100 000 population (9·35–9·65) in the Gaza Strip. 92 (61%) patients were boys. 117 (77%) cases of meningococcal septicaemia were diagnosed by use of Gram stain. Only *Neisseria meningitidis* serotype B (no available vaccine) was identified in 22 of 32 culture-positive cases—17 meningococcal meningitis and five meningococcal septicaemia. Children who had received antibiotics (28 [19%]) before admission and those who had not received antibiotics (123 [81%]) did not differ in terms of the culture results or CFRs. 25 (17%) children with meningococcal septicaemia died (16 boys; CFR 23%). CFR was highest in infants (six [24%]).

Interpretation Despite the use of identical diagnostic criteria, the incidence of meningococcal disease was much higher in the Gaza Strip than in the West Bank, oPt (9·50 cases per 100 000 population *vs* 0·04 per 100 000 population, respectively). The higher population density and humidity in the Gaza Strip might contribute to the higher incidence of the disease. Most of the CSF or blood cultures from the confirmed cases in the Gaza Strip were negative, suggesting a laboratory error. The results suggest the need for reassessment of quality-control measures in the laboratories in this region and the introduction of other laboratory technologies such as latex agglutination and PCR.

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Contributors
All authors contributed equally.

Conflicts of interest
We declare that we have no conflicts of interest.

Patient flow and medical consequences of the Israeli operation *Pillar of Defence*: a retrospective study

Mads Gilbert, Sobhi Skaik

Background The Israeli military attack *Pillar of Defence* on the Gaza Strip, occupied Palestinian territory (also referred to as State of Palestine), from Nov 14–21, 2012, killed more than 190 and injured more than 1490 Palestinians. 48 of the people killed were aged 18 years or younger, and 16 were 5 years or younger. 504 of the people injured were aged 18 years or younger, and 195 were 5 years or younger. The rest of the individuals injured or killed were older than 18 years. Six Israelis were killed and 224 were injured. We were working in Al-Shifa Hospital, Gaza City, during the attacks and assessed the flow of patients through the emergency department during 8 days of bombing by the Israeli military.

Methods Data for all patients brought to Al-Shifa Hospital's emergency department were obtained retrospectively from handwritten emergency department protocols, and intensive care unit (ICU) and operating room records. We recorded the total number of hospital admissions, deaths, admissions to the ICU, patients operated on, and patients transferred to Egypt. Data were gathered for admissions, demographics, cause of injury, surgery, ICU admissions, and deaths. Microsoft Excel 2010 was used to analyse the data. The study was approved by the hospital's director and board.

Findings 680 of the injured or killed Palestinians were brought to the hospital's emergency department with injuries from bombing by drones, F-16 fighter planes, helicopters, or naval artillery: 501 (74%) male and 179 (26%) female individuals, including 74 (11%) children aged 18 years or younger. 145 (21%) Palestinians were admitted: 44 (30%) during the first 4 days and 101 (70%) during the last 4 days of bombing. 43 (30%) of 145 individuals needed intensive care (32 [74%] adults and 11 [26%] aged ≤5 years). Of the patients admitted to the ICU, 29 (67%) were discharged, 11 (26%) transferred to Egypt, and three (7%) died in the ICU. 62 (9%) of 680 people who were injured died: 50 (81%) were dead on arrival, seven (11%) died in the operating room, three (5%) died in the ICU, and two (3%) after transfer to Egypt. 110 (76%) of 145 patients admitted to Al-Shifa Hospital were operated on, most were taken directly to the operating room after rapid triage and critical stabilisation in the emergency department. 39 (35%) patients had laparotomies, and 42 (38%) orthopaedic, 22 (20%) neurosurgical, eight (7%) vascular, and four (4%) plastic surgical operations; total number of operations was greater than 110 because most patients had more than one trauma. 39 patients were transferred to Egypt. Most of the people with injuries were civilians.

Interpretation A large influx of patients who had war trauma was managed in Al-Shifa Hospital despite the erosion of infrastructure, supplies, and general population health from the previous 5-year Israeli siege. Improved, stricter triage reduced patient admission during the 2012 Israeli military attack versus the Israeli military attacks in 2008–09. Additionally, hospital staff were better prepared and trained for the casualties of the 2012 military attack and few deaths occurred in the ICU. A high number of individuals with fatal injuries were dead on arrival, indicating the need for better prehospital triage to safeguard hospital capacity.

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Contributors
MG conceived the original idea for the study, wrote the Abstract, and handled the data. SS participated in the data gathering and handling, and writing of the Abstract. Both authors worked at Al-Shifa Hospital.

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Patient flow and medical consequences of the Israeli operation *Pillar of Defence*: a retrospective study

Mads Gilbert, Sobhi Skaik

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Funding None.

Contributors
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Use of gynaecological laparoscopy in a hospital ward in the West Bank, occupied Palestinian territory: a retrospective audit

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Background Gynaecological laparoscopy is an important diagnostic and interventional method. It is widely applied, and increasingly accepted by the community because it is minimally invasive and is cheaper than the other methods. The introduction of gynaecological laparoscopy at Hebron Governmental Hospital, West Bank, occupied Palestinian territory (oPt), was an important step forward in service delivery. Despite several logistical barriers to adequate service provision in the biggest city in the oPt, the hospital serves more than 600 000 citizens with a small gynaecological ward (22 beds at the time of the study) and few funding sources compared with other hospitals in the oPt. Additionally our ward is the busiest compared with the gynaecological wards in other hospitals in the oPt. Our aim was to show that use of minimally invasive surgery such as laparoscopy can reduce hospital admission time and costs with a complication rate in the oPt that does not differ much from the international rate.

Methods All gynaecological laparoscopic procedures (diagnostic and interventional) that were done between Jan 1, 2011, and Jan 1, 2013, in Hebron Hospital were included in this retrospective study. After obtaining written or verbal informed consent from all patients included in the study, data were gathered for inpatient stay and rates of complications. Our data were compared with those reported internationally in PubMed in recent years. We used SPSS (version 17.0) for the statistical analysis. The hospital's medical counsel provided ethics approval to undertake the study.

Findings 200 women (mean age 28 years [range 25–35]) were admitted for gynaecological laparoscopic intervention: 65 for diagnostic laparoscopy and 135 for interventional laparoscopy. The inpatient stay in our ward was 1 day, similar to that reported internationally. The overall complication rate in the ward was 6% (six intraoperative and six postoperative complications). The complication rate reported in the Department of Obstetrics and Gynecology, St John Hospital and Medical Center, Detroit, MI, USA, was 9·8% between January, 1996, and June, 1996, and the overall complication rate in the Centre Hospitalier Universitaire Cochin Saint-Vincent-de-Paul, Paris, France, was 4·64 per 1000 gynaecological laparoscopies.

Interpretation The use of laparoscopic gynaecology for diagnosis and treatment of emerging indications is an important advantage, especially for patients who have several logistical barriers to accessing health care in the oPt—eg, long distance from the hospital—because it can reduce the inpatient stay and the need for postoperative care. However, care must be taken with interventional laparoscopy to reduce the risk of complications.

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Contributors
OSH and SHK contributed equally to the study, but OSH did most of the laparoscopies.

Conflicts of interest
We declare that we have no conflicts of interest.

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Effect of infertility on women in the occupied Palestinian territory: a pilot qualitative study

Doaa Hammoudeh, Layaly Hamayel, Niveen M E Abu-Rmeileh, Rita Giacaman

Background Palestinian fertility is at the forefront of political, demographic, and social debates. However, little is known about the effect of infertility on women. Evidence suggests that 7–8% of Palestinian couples have difficulty conceiving, with causes attributable to half the women and half the men. The social, psychological, economic, and physical effects of infertility on women living in the occupied Palestinian territory (oPt) were assessed.

Methods In this pilot qualitative study, 34 women (mean age 30 years, range 19–42) attending four primary health-care clinics in the north and south West Bank were interviewed by four research assistants, including DH and LH, with a locally developed semistructured interview schedule, which was piloted and modified accordingly. Approval to undertake the study was obtained from the Institute of Community and Public Health, Birzeit University, Ramallah, West Bank, oPt. Participants provided verbal informed consent. Data were analysed by reading and rereading transcripts until themes and subthemes were identified.

Findings Women reported physical symptoms that they associated with infertility, including insomnia, fatigue, dizziness, palpitations, and breathing problems. Most reported feeling emotionally drained or overwhelmed, frustrated, and hopeless. Feelings of anxiety, sadness, and *hamm* (a combination of different feelings, including anger, distress, frustration, grief, incapacitation, worry, and sorrow) were common. Most women described a void in their lives, feeling incomplete, and unable to fulfil their role as mothers. Fear of ageing without children was common, and some women reported excessive crying at home. The social effect of infertility depended on the surrounding support. Some women reported that their in-laws were more supportive than were their own families. Other women reported cruel treatment by their in-laws, including blaming the woman for the couple's infertility. The effect of communal gossip was felt strongly, making women feel hurt and stigmatised. Almost all women noted a substantial economic burden in their struggle to conceive.

Interpretation Physical symptoms might be due to severe pressure on women because of their inability to fulfil their biological and social roles. Symptoms might also be due to treatments, especially hormonal therapy and surgery; the side-effects for these treatments include discomfort, irritability, physical pain, and mood changes. In Palestinian society, children provide social security in old age, making infertility a serious long-term issue related to the care of elderly family members. Efforts must be made to attend to the physical, social, psychological, and economic needs of women dealing with infertility.

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All authors contributed to the conceptualisation of this study. DH and LH participated in the fieldwork. DH wrote the Abstract and the other authors read and provided comments.

Conflicts of interest

We declare that we have no conflicts of interest.

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Political fertility in the occupied Palestinian territory: an ethnographic study

Liv Nanna Hansson, Siri Tellier, Lotte Buch Segal, Maysoon Bseiso

Background Although fertility rates in the occupied Palestinian territory (oPt) have fallen, they were still high at 4·5 births per woman in 2009. The high fertility rate has been explained by the importance attributed to the size of the population (political fertility) in the context of the conflict between Israel and the oPt. We assessed how political fertility is perceived by refugee mothers in the West Bank, oPt.

Methods We undertook eight semistructured interviews with mothers in the UN Relief and Works Agency for Palestine Refugees in the Near East's (UNRWA) refugee camp Qalandia, West Bank, in 2011. To identify possible political meanings in the West Bank, mothers using reproductive health services were purposively sampled on the basis of the number of their children (one to six) and imprisoned family members (yes or no) to represent the widest possible group of women. We did a content analysis of the empirical material. UNRWA provided ethics approval for the study. All women provided verbal informed consent before participating in the study.

Findings Seven of eight mothers gave political reasons for having children, including the Israeli occupation. The mothers feared death or imprisonment of their adolescent sons by the Israeli military. For most mothers, these fears prompted them to have more children to counter such losses; however, some mothers who had sons imprisoned or killed in the conflict had fewer children because of the loss of an income provider and because they were scared of losing another child. Furthermore, mothers who did not think of themselves as being part of a national struggle were having many children. Four of eight mothers brought up infertility and were concerned about its social and political implications.

Interpretation Although only eight women were interviewed, their responses give us an idea of the views of Palestinian refugee mothers living in the West Bank. Globally, high fertility rates are often associated with high child mortality rates, which does not seem to be the case in the oPt. Rather, the results of this study show that perceived risks of adolescent imprisonment and mortality affect decisions about fertility. Views of family size were also affected by birth spacing and a preference for sons. We conclude that political fertility in the West Bank does not necessarily mean a higher rate of births and not all fertility is political.

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Conflicts of interest
We declare that we have no conflicts of interest.

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Medicalisation of childbirth in the occupied Palestinian territory: an operational study

Sahar Hassan, Johanne Sundby, Abdullatif Husseini, Espen Bjertness

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Background Almost all births in the occupied Palestinian territory happen in hospitals, and births without complications are assisted by midwives. The application of evidence-based treatment and care during normal childbirth is inadequate. We report changes in practices during normal childbirth through the implementation of interventions aimed at reducing the frequency of intravenous fluid administration, bladder catheterisation, analgesia, artificial rupture of membranes, oxytocin use for augmentation, vaginal examinations, and episiotomy, and increasing mobility, oral intake of fluids, and initiation of immediate breastfeeding.

Methods We undertook operational research in three phases (baseline [6 months], intervention [18 months], and postintervention [12 months]) in one governmental hospital in the West Bank between 2005 and 2010. We assessed 2345 women—134 in the baseline phase, 1860 in the intervention phase, and 351 in the postintervention phase. During the baseline phase, 2 weeks in 2006, we interviewed all women (mean age 26·1 years [5·8]) after they gave birth but before their discharge from the hospital. In 2007–08, we implemented the interventions, including on-the-job training, auditing, feedback, and meetings with staff. We used a checklist to document the details of care for all pregnant women with singleton pregnancies (n=2146), who went into labour and delivered between 0700 h and 1600 h (when all physicians and consultants are on duty), 2–3 days per week. We excluded 286 women from the analysis because of pre-existing complications, breech, gestational age less than 37 weeks, birth before arrival, and labour during the 3 months of strike in the public health sector. In the postintervention phase (2010), 9 months after the completion of the intervention, we used the same checklist for a sample of 383 women to assess the sustainability of the changes. The changes in practices were tested with χ^2 and Fisher's exact tests. We analysed data with IBM SPSS Statistics (version 18.0). We obtained permission from the Palestinian Ministry of Health to interview women in the hospital. All women provided verbal informed consent before they were interviewed.

Findings Improvements from baseline to the postintervention phase were significant ($p<0·05$) and sustained for seven of ten practices: oxytocin use to augment normal labour (43 [32·1%] of 134 women *vs* 62 [17·7%] of 351 women; improvement 14·4%), artificial rupture of membranes (98 [73·1%] *vs* 182 [51·9%]; 21·2%), intravenous fluids (103 [76·9%] *vs* 97 [27·6%]; 49·3%), oral intake of fluids during labour (five [3·7%] *vs* 39 [11·1%]; 7·4%), mobility during labour (41 [30·6%] *vs* 120 [34·2%]; 3·6%), four to seven (65 [48·5%] *vs* 130 [37·0%]; 11·5%) and eight to 22 vaginal examinations (20 [14·9%] *vs* 23 [6·6%]; 8·3%), episiotomy for first pregnancy (24 [80·0%] of 30 *vs* 34 [39·1%] of 87; 40·9%) or second and subsequent pregnancies (six [5·8%] of 104 *vs* nine [3·4%] of 264; 2·4%), and immediate breastfeeding (77 [57·5%] of 134 *vs* 328 [93·4%] of 351; 35·9%). The improvements in the mobility and oral intake of fluids during labour were not sustained 9 months after the completion of the intervention phase. The use of analgesia during labour did not change (five [3·7%] *vs* 13 [3·7%] women).

Interpretation A limitation of our analysis was the small sample size in the baseline phase. Some changes in the practices during normal childbirth were sustainable during the 9 months after the completion of the intervention. On-the-job training, auditing, and feedback were non-threatening, and a provider-friendly approach enabled integration of evidence into practice with the available resources. In a low-resource setting, supportive supervision, on-the-job training, and regular clinical audit are essential low-cost methods to increase adherence by midwives to the best available evidence and enhance their professional capacities to keep birth normal.

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Contributors

SH conceptualised, designed, and piloted the research methods; gathered the data for the assessment; designed, supervised, and participated in the implementation of the interventions; supervised data gathering, entry, and analysis; and wrote the first draft of the Abstract. EB and AH contributed to the conceptualisation, design, analysis, and interpretation of the analysis. JS contributed to the conceptualisation, analysis, and interpretation of the findings. All authors have approved the final version of the Abstract for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

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Self-care and glycaemic control: a cross-sectional study

Sawsan Imseeh, Nahed Mikki, Rula Ghandour, Rita Giacaman, Margareta Norberg, Lars Jerdén, Hans Stenlund, Abdullatif Husseini

Background Diabetes mellitus type 2 is a leading cause of morbidity and mortality in the occupied Palestinian territory (oPt), with a prevalence of 12·5% in adults aged 25–64 years in 2010–11. Studies of the management and control of diabetes mellitus in the oPt are lacking. The association between diabetes self-care, provider recommendations, and glycaemic control was investigated in a sample of adults with diabetes mellitus type 2 in Ramallah, West Bank, oPt.

Methods A sample of 517 individuals with diabetes mellitus type 2 (166 men and 351 women who were not pregnant) was selected from 11 diabetes clinics owned by the Palestinian Ministry of Health (MoH; n=5), UN Relief and Works Agency for Palestine Refugees in the Near East (n=4), and jointly by non-governmental organisations and MoH (n=2). The number of individuals selected from each clinic was proportional to the number of patients being treated for diabetes at the clinic. Patients were identified from the clinics' databases; 62 (11%) of 579 refused to participate. All participants provided verbal informed consent. The Summary of Diabetes Self-Care Activities questionnaire was used to assess self-care behaviour and providers' recommendations. The glycated haemoglobin A_{1c} (HbA_{1c}) test was done to assess glycaemic control. Data were gathered during March to June, 2012, and analysed with SPSS (version 18.0). Logistic regression analysis was used to ascertain factors associated with poor glycaemic control. Approval to undertake the study was obtained from the Institute of Community and Public Health, Birzeit University, Ramallah, West Bank, oPt.

Findings The mean HbA_{1c} was 8·8% (73 mmol/mol [SD 2·0 and 2, respectively]). One in five patients had glycaemic control (HbA_{1c} <7%). 303 (59%) of 517 participants did not have a healthy eating plan, 276 (53%) of 516 did not exercise, 307 (59%) of 516 did not check their blood sugar level, 86 (17%) of 517 were not given nutritional advice, 127 (25%) of 517 were not given advice about exercise, and 341 (66%) had not been advised to check their blood sugar regularly. Results of the logistic regression analysis showed that demographics, socioeconomic status, self-care, and providers' recommendations for self-care were not associated with poor glycaemic control. The only significant finding was a negative association between poor glycaemic control and duration of diabetes (p<0·001).

Interpretation The results of this study show that although patients in the West Bank are provided medication, health education and monitoring are insufficient and support is non-existent—these would help patients to control their diabetes mellitus. Further research is needed to confirm these findings.

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We declare that we have no conflicts of interest.

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Time to pregnancy and exposure to pesticides in farmers in the West Bank, occupied Palestinian territory: a 1-year follow-up of newly married couples

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Background Pesticides have been associated with a reduction in reproductive capacity. In the occupied Palestinian territory, agricultural work is a family enterprise rendering all members at risk of occupational or paraoccupational exposure. We investigated the effects of pesticide exposure on couples' fecundability (probability of conception in a menstrual cycle).

Methods 331 newly married couples (women aged 16–66 years and men 15–42 years) from two Palestinian villages in the Hebron Governorate, West Bank, who were attempting to conceive for the first time during 2005–07, were identified from the Thalassaemia Centre, Hebron, where all individuals who are planning to marry are obliged to register. Couples were followed up prospectively from marriage until pregnancy or a maximum of 12 months. We assessed male exposure on the basis of current use of pesticides by creating a time-dependent exposure variable covering the month of follow-up and the 2 months before the follow-up. In women, work in farming was used as an indicator of exposure. We estimated the adjusted fecundability density ratio (aFDR) with discrete proportional hazards regression. Covariates for the multivariable model, selected on the basis of a-priori assumptions, were coital frequency reported by the women, and for men and women body-mass index, age and education, and village of residence. SPSS (version 16.0) and Stata (version 10.0) were used for statistical analyses. The study was done in accordance with the current revision of the Helsinki Declaration and was approved by Hebron University. All participants provided written informed consent and were informed that participation was voluntary and that they could withdraw from the study at any time.

Findings Follow-up was completed in all but four couples. 288 (87%) of 331 couples became pregnant during follow-up with a mean fecundability of 0·20 (95% CI 0·19–0·22). Fecundability was moderately reduced in association with pesticide exposure in men (aFDR 0·72; 0·52–1·00) and farming in women (0·68; 0·42–1·09).

Interpretation Exposure to pesticides was associated with reduced fecundability in couples. Furthermore, in the Palestinian population, the first menstrual cycle at risk could be defined accurately because premarital sex or having children outside of marriage are cultural and religious taboos and because all couples stated that they intended to start attempting to conceive immediately after the wedding. The main limitation was that pesticide exposure was reported as crude data, which could lead to an underestimation of the effect of pesticide exposure. Further research with improved exposure data is warranted.

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Contributors

All authors participated in the conceptualisation and writing of the Abstract and have seen, reviewed, and approved the final version. YYI, KN, EB, and PK designed the study and study methods. YYI and KN participated in the monitoring of the data gathering. YYI, MS, KN, EB, and PK participated in data analysis and interpretation.

Conflicts of interest

We declare that we have no conflicts of interest.

Acknowledgments

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Assessment of the cause of death registry in the occupied Palestinian territory: a qualitative study

Bjørn G Iversen, Munia Abul Hawa, Anne Gro Pedersen, Svein Gåsemyr, Abdelnasser Soboh

Background Decision makers use mortality data extensively. However, data quality—which depends on the accuracy of completion of the death notification form (DNF)—is inadequate in many countries, including the occupied Palestinian territory (oPt) where a cause of death registry was established in 1994. According to the National Health Information System Strategy (2013–15), issued by the Palestinian Ministry of Health in collaboration with WHO, the reporting of mortality data, including the DNF, needs to be improved in the oPt. The aim in this study was to assess and make recommendations for improvements in the reporting of mortality data to the cause of death registry, with the focus on hospitals and the DNF.

Methods The study was undertaken in October, 2012, in the West Bank and Gaza Strip, both in the oPt, in collaboration with the Ministry of Health. An assessment team used qualitative methods for formal assessment of surveillance systems and registries as described by WHO and the Centers for Disease Control and Prevention, Atlanta, GA, USA. We held two start-up workshops with participants from key stakeholder institutions (16 in the West Bank and 19 in the Gaza Strip), and two focus group interviews (12 participants, Alia hospital, West Bank, and eight from different hospitals, Gaza Strip). We undertook in-depth interviews of two doctors from Rafidia Hospital, the director of the Palestinian Health Information Center who was in charge of the registry at a national level, and a district health director. The assessment team summarised and discussed all the findings and then formulated a total of 33 tasks organised into ten recommendations, which were reviewed by the Palestinian Ministry of Health, WHO, Norwegian Institute of Public Health, and Statistics Norway, both in Oslo, Norway, with final approval by the Palestinian Ministry of Health. All participants were informed about the aim of the assessment and how the information that they provided would be used. The assessment team did not have access to any confidential patient data or interview patients.

Findings For the Palestinian cause of death registry, there were no formal definitions, quality documents, and standard operating procedures. Doctors had no guidelines for completing DNFs, with little training or supervision in the hospitals, few data quality checks were done, and there was a lack of quality-assurance systems at all levels. Only one person in the West Bank and one in the Gaza Strip assessed the DNFs and assigned the International Statistical Classification of Diseases and Related Health Problems, tenth revision (ICD-10) codes. Hospital doctors had inadequate understanding of how to apply the diagnoses, and there was no feedback of the results to the hospitals. Information was disseminated through a few tables in a yearly report.

Interpretation Ten recommendations by the investigators for the improvement in the reporting of mortality data are: revise the DNF and develop guidelines; develop standard operating procedures to describe all aspects of the cause of death registry, including quality assurance systems and introduction of an electronic coding aid; identify a focal point doctor in each hospital to be responsible for all quality-assurance issues in relation to the DNF, including training of the hospital doctors; establish training programmes for hospital doctors; improve data output and feedback from the registry; synchronise flow of data with the population registry; and audit the quality of diagnoses in the cause of death registry. Assessments of other parts of this registry are further advised. About half of all deaths in the oPt occur in hospitals. Additionally, about half of the individuals who die outside of hospitals in the Gaza Strip (a quarter of the total number of deaths) are dead when they are brought to the hospital.

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BGI was the main investigator and led the work during the planning, undertaking, writing, and finalisation phases. MAH was in charge of gathering the background information and participated in all stages of the study. AGP and SG participated in the planning of the study and were in charge of the focus groups and in-depth interviews. AS participated in the planning of the study and was in charge of the activities in the Gaza Strip.

Conflicts of interest

We declare that we have no conflicts of interest.

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Prevalence, awareness, treatment, and control of hypertension in adult Palestinians: a cross-sectional study

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Background Hypertension and its complications are major health problems in the West Bank, occupied Palestinian territory (oPt); the results of preliminary surveys suggest that the prevalence of hypertension might be as high as 24%. The aim in this study was to estimate the prevalence and distribution of hypertension and to ascertain awareness, treatment, and control in the general adult population in the West Bank.

Methods In a cross-sectional survey of the West Bank, patients and accompanying individuals older than 25 years (n=2258) were invited for participation in the study and screened for hypertension between May and December, 2011, at six governmental primary health-care clinics in the rural and urban Palestinian communities in the three main governorates (Hebron, Nablus, and Ramallah). During clinic visits, trained research staff administered a standard questionnaire. They gathered information about patients' diagnosis awareness, drug treatment, and demographic characteristics. Trained and certified observers used an American Heart Association protocol to obtain two blood pressure measurements from each participant. Hypertension was defined as a mean systolic blood pressure of at least 140 mm Hg and a diastolic blood pressure of at least 90 mm Hg, or self-reported current treatment for hypertension with an antihypertensive medication. Data were analysed with SPSS (version 18.0). χ^2 was used to test for independency of the distribution of individuals with diagnosed and undiagnosed hypertension, and the dependency of the distribution of the individuals with controlled and uncontrolled hypertension. The level of significance was set at $p<0\cdot05$. The clinical research committee at the Faculty of Pharmacy, Al-Quds University, East Jerusalem, West Bank, oPt, provided ethics approval to do this study. All patients provided verbal informed consent.

Findings 2077 individuals (mean age 40·1 years [SD 12·1]) participated in the survey. 1204 (58%) of the participants were women, 1329 (64%) lived in urban areas, and 748 (36%) lived in rural areas. The overall prevalence of hypertension was 573 (28%; 255 [29%] of 873 men, 318 [26%] of 1204 women; $p=0\cdot04$). Prevalence of hypertension increased with age in both men and women (data not shown). The rural–urban difference in prevalence was not significant (200 [27%] and 373 [28%]; respectively; $p=0\cdot08$). 293 (51%) of 573 patients with hypertension were aware of their raised blood pressure, 229 (40%) were on treatment, and 58 (10%) achieved targeted control of blood pressure (<140 mm Hg/90 mm Hg). Of the patients treated for hypertension, only 76 (33%) had targeted control of blood pressure.

Interpretation Prevalence of hypertension in the adult Palestinian population was high, with inadequate awareness, treatment, and control of the blood pressure. A concerted public health effort is needed to improve the detection, treatment, and control of hypertension.

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Contributors
MRK and HOH did the data analysis and wrote the Abstract. MS and QNA-S gathered the data.

Conflicts of interest
We declare that we have no conflicts of interest.

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Quality of life for Palestinian patients with cancer in the absence of a palliative-care service: a triangulated study

Mohamad H Khleif, Asma M Imam

Background Cancer is a devastating illness that can deplete the resources of both the individual and the community. In the occupied Palestinian territory (oPt), it is the second leading cause of death (12%). Most cases are diagnosed at a late stage and patients are given little pain control and palliative care. In this study, we aimed to assess the determinants of quality of life (QoL) scores, and the symptoms in patients with cancer.

Methods The study was done in the three main hospitals—Beit Jala Governmental Hospital, Watani Governmental Hospital, and Augusta Victoria Hospital—for cancer care in the West Bank, oPt, between May 1, to July 31, 2012. Patients (aged 18–90 years) with cancer who were attending the hospitals for treatment and follow-up were selected by convenient sampling and had qualitative in-depth interviews guided with five open-ended questions that were reviewed and validated by a palliative care doctor, a palliative care nurse, an oncologist, a social worker, and a researcher, and completed the cross-sectional quantitative European Organisation for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30; scale 0–100). We did several statistical tests (*t*, ANOVA, χ^2, multiple linear regression analysis) using IBM-SPSS (version 19.0.0). We obtained written informed consent from all participants and interviewees, and study approval from the faculty board at the School of Public Health, Al-Quds University, East Jerusalem, West Bank, and the Helsinki Committee, Gaza Strip, oPt.

Findings Ten patients completed the qualitative in-depth interviews and 323 (92%) of 350 completed the cross-sectional quantitative questionnaire EORTC QLQ-C30. In the qualitative interviews, respondents expressed several needs: financial aid, pain management, properly equipped health-care facilities in their vicinity, availability of medication, eradication of stigma, improved communication by the health-care team with the patient and psychosocial support, home nursing care, and palliative care. In the regression analysis, predictors of poor-health-related QoL (defined as <50; mean score 41·8) were advanced stage of cancer (β=–0·3; p<0·0001), poor economical situation (income <2000 NIS; β=0·19; p=0·001), low educational level (<10 years; β=0·12; p=0·04), and longer than 6 months of treatment (β=–0·11; p=0·04). The QoL domains with poor scores were physical (mean score 48·5), role (48·8), emotional (46·0), and social functioning (50·0), whereas the scores were worse for financial difficulties (64·6) and symptoms (fatigue [66·6], pain [63·0], and insomnia [56·4]). All these results were worse than were those for patients with cancer in Kuwait, Turkey, and the UK.

Interpretation Palestinian patients with cancer encounter many difficulties in terms of their QoL. Palliative care for these patients should be integrated into the health-care system to improve their QoL. We recommend that policy makers integrate special services, such as palliative care, into the health-care system in the oPt to improve QoL and reduce suffering of these patients.

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Contributors

MHK designed the study; did the literature search; gathered, analysed, and interpreted the data; and wrote the Abstract. AMI designed the study, interpreted the data, and supervised the study.

Conflicts of interest

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Perceptions of drug use and sexual behaviours of adolescents in the West Bank, occupied Palestinian territory: a qualitative study

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Background Little is known about the health-risk behaviours of young people in the Middle East, particularly the occupied Palestinian territory (oPt). Our aim in this study was to gain insights into the prevalence and patterns of risk-taking behaviours of Palestinian youth.

Methods We organised ten focus groups and 17 in-depth interviews with young people (aged 16–24 years) as part of the formative phase of a cross-sectional representative study of risk behaviours in the West Bank, including East Jerusalem, oPt, in 2012. A combination of purposive and convenience sampling was used to select the sample, with representation of male and female young people from different localities in the region (urban, rural, refugee camps). The non-probability sample was balanced across these categories, but the people whom we interviewed might not be representative of the overall young Palestinian population. NVivo (version 9) was used for the qualitative analysis. RAND Corporation, Santa Monica, CA, USA, approved the study protocol in January, 2012. We obtained informed verbal consent from participants aged 18 years and older, and assent from participants younger than 18 years and their parents.

Findings 83 individuals (42 male and 41 female; mean age 20·0 years [SD 2·2]) participated in the study. Participants reported that substance use and sexual activity outside marriage were common, even in conservative communities. Use of drugs, the most common of which were hashish and marijuana, was perceived to be especially prevalent in refugee camps and in East Jerusalem. The most commonly reported types of sexual activity were oral and anal intercourse. Vaginal intercourse was less common than were other types of sexual intercourse outside marriage. Some young people had sexual intercourse with sex workers; they went to brothels in the West Bank, including East Jerusalem, and in Israel. Most respondents were of the opinion that young people did not usually use protection during sexual intercourse.

Interpretation To the best of our knowledge, this is the first study of the health-risk behaviours of young Palestinian people. By contrast with the conservative social context in the oPt, the findings suggest that drug use and unprotected sexual intercourse outside marriage might be more common than is currently assumed. These results might be perceived as indicating surprisingly high rates of sexual and other risky behaviours; however, we cannot exclude the possibility that participants might have overstated or understated drug use and sexual behaviours, but this possibility is unlikely to be a major concern for focus groups discussing young people in general and for participants who are of the opinion that there is a high prevalence of these behaviours. Health-risk behaviours in the oPt are a concern because of the low awareness of the potential health consequences. The results draw attention to the need to include sexual reproductive health on the national agenda and ensure that it is included in the programmes of national institutions. The formative findings from this study will be used to further explore the issues in a larger representative sample to improve understanding of prevalence, patterns, and causes of risk-taking behaviours.

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Contributors

All authors were responsible for the study design, data gathering, interpretation of the results, and writing and editing of the Abstract. SM, RK, and RB contributed to the data analysis. All authors have read and approved the final version of the Abstract for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

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Prediction of health with human insecurity and chronic economic constraints in the occupied Palestinian territory: a cross-sectional survey

Clea McNeely, Brian K Barber, Carolyn Spellings, Rita Giacaman, Cairo Arafat, Eyad El Sarraj, Mahmoud Daher, Mohammed Abu Mallouh

Background Research into the effects of political conflict has focused predominantly on the association between exposure to violence and psychological trauma. This focus was expanded by investigation of the association of a broad array of political and economic factors with four health outcomes in the occupied Palestinian territory (oPt).

Methods The Palestinian Center for Policy and Survey Research, Ramallah, West Bank, oPt, undertook household interviews in 2011 with a representative sample of 508 people aged 30–40 years. Interviews included culturally-informed questions about current wellbeing and past political and economic experiences. Health outcomes were assessed as limitations on functioning due to health (one item, 1 [never] to 5 [regularly]); feeling broken or destroyed (six items, α=0·81, range 1–5) such as the extent to which respondents felt emotionally exhausted or their spirits broken; feelings of depression (eight items, α=0·84, 0–3); and trauma-related stress (17 items on the Post-Traumatic Stress Disorder Checklist, α=0·92, 0–3). Political and economic conditions were assessed as 34 outcomes, including human insecurity (five items, α=0·80, 1–5) such as the extent to which respondents felt fear for themselves or their family in their daily life and the extent to which they worry or fear for their and their family's future; resource inadequacy (six items, α=0·84, 1–5); heard or felt effects of a bomb (one item, 0–1); or was hit, kicked, shot at, or verbally abused (three items, α=0·83, 1–5). Data were analysed with ordered logit and ordinary least-squares regression models using Stata (version 12.1). The study was approved by the institutional review board of the University of Tennessee, Knoxville, TN, USA. All participants provided written informed consent.

Findings 508 (97%) of 524 households took part in the interviews. When other covariates were controlled for, human insecurity and inadequacy of economic resources were positively associated with all four health outcomes: functional limitations (odds ratio 1·29, p=0·029, and 1·43, p<0·001, respectively), feeling broken or destroyed (β=0·29, p<0·001; and β=0·24, p<0·001, respectively), feelings of depression (β=0·11, p=0·001, and β=0·18, p<0·001, respectively), and trauma-related stress (β=0·18, p<0·001, and β=0·09, p=0·003, respectively). Direct personal exposure to political violence was related only to trauma-related stress (heard or felt effects of a bomb β=0·13, p=0·049); ever hit, kicked, shot at, or verbally abused by the Israeli Defense Forces (β=0·07, p=0·008).

Interpretation These findings support the increasing recognition that human insecurity and chronic economic constraints in the oPt threaten health, perhaps more so than does direct exposure to violence.

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CM did the statistical analysis and wrote the Abstract with input from BKB, CS, and RG. BKB, CM, and CS designed the survey questionnaire with extensive input from RG, CA, EES, MD, and MAM.

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Contraceptive behaviour as a marital responsibility in the occupied Palestinian territory: a cross-sectional survey

Sarah Memmi

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Background The fertility of Palestinians in the occupied Palestinian territory (oPt) has fallen substantially from 6·2 children to 4·12 children per woman during the past 20 years. Contraceptives have a major role in birth control, but husbands are usually not included in research into the use of contraception. The aim in this study was to identify determinants and outcomes of the involvement of husbands in the decision to use contraception.

Methods For the 2006 Palestinian Family Health Survey in the West Bank and Gaza Strip, oPt, 4486 (81%) of 5542 women (aged 15–54 years) who were married, not pregnant, and not menopausal were interviewed about the husband's involvement and interest in family planning. The women's responses were analysed with logistic regression models. SPSS (version 17.0) was used for the statistical analysis. This study was approved by the review board of the Paris Descartes University, Paris, France. The Palestinian Central Bureau of Statistics obtained verbal informed consent from the women.

Findings Three main factors—communication between the couple about contraception, desire for children, and husband's decision—determined whether and the type of contraceptive used (all types of contraceptive methods, male contraceptive, or female contraceptive). Contraceptive use was reported by 2444 (54%) of 4486 women: 1763 (39%) used female contraceptives and 681 (15%) used male contraceptives. Communication with the spouse increased the odds of contraceptive use compared with no communication (1488 [56%] of 2636 *vs* 956 [52%] of 1850; odds ratio 1·08 [95% CI 1·02–1·31). Women whose husbands wanted fewer children versus those who wanted more children were more likely to use contraception (373 [64%] of 582 *vs* 730 [52%] of 1394, 1·90 [1·41–2·56]), particularly male contraceptives versus female contraceptives (119 [32%] of 373 *vs* 189 [26%] of 730, 1·58 [1·21–2·05]). The use of contraception decreased when the husband (husband's decision 356 [44%] of 809 *vs* joint decision 1836 [58%] of 3186; 0·56 [0·46–0·69]) or the wife (wife's decision 240 [55%] of 433 *vs* joint decision 1836 [58%] of 3186; 0·76 [0·59–0·99]) made the sole decision about use of contraception. Women were less likely to decide on their own to use contraception if couples did not yet have a son (41 [8%] of 533 *vs* 248 [12%] of 2118; 0·60 [0·37–0·98]) and wanted another child (167 [8%] of 2108 *vs* 220 [12%] of 1790; 0·70 [0·52–0·95]).

Interpretation Contraceptive use by Palestinians involves both husbands and wives. Communication between the couple and joint decision making lead to greater contraceptive choice, especially the use of a male contraceptive method. Thus, joint decision making is a determinant of the fertility transition in the occupied Palestinian territory, and should be considered in future research.

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Prevalence of birth defects in the Gaza Strip, occupied Palestinian territory, from 1997 to 2010: a pedigree analysis

Awny Naim, Roberto Minutolo, Simona Signoriello, Paula Manduca

Background There are no reliable records of the prevalence of birth defects from 1997 to 2010 in the Gaza Strip, occupied Palestinian territory. We therefore estimated the prevalence of birth defects for these years, using data from the first pilot registration of births in 2011.

Methods During the pilot registration of births at Al-Shifa Hospital, Gaza Strip, in 2011, using face-to-face interviews, we obtained the full reproductive histories and pedigrees of the mothers (n=4027), data about the health of first-degree and second-degree relatives of both parents of the newborn baby, and exposure to attacks in 2008–09. 58 mothers with healthy neonates born in 2011, and at least one older child with a birth defect were identified and included in the study. Data for the pedigrees and dates of births of the children born to these 58 couples from 1997 to 2010 were pooled for 2-year intervals to calculate the proportions of children with birth defects. The linear trends in the proportions of birth defects were assessed with the Cochran-Armitrage test, and differences in birth defects in families with fewer or not fewer than four children were assessed with the χ^2 exact test. Statistical analysis was done with Cytel Studio (version 9.0.0). The study was approved by the Ministry of Health, Gaza Strip. Participants provided written informed consent.

Findings 58 couples had 226 children, of whom 69 had birth defects. Inheritance of disease was suggested in eight couples who had two children with the same birth (familiar) defect and six who had the familiar defect in their first-degree relatives; 45 couples had one child each with a birth defect, suggesting that it was sporadic. The frequencies of children with birth defects showed a significant increase from 2005 (p=0·0003)—four (20%) of 20, four (18%) of 22, four (15%) of 27, six (17%) of 35, 17 (40%) of 43, 18 (38%) of 48, and 16 (52%) of 31 children born during 1997–98, 1999–2000, 2001–02, 2003–04, 2005–06, 2007–08, and 2009–10, respectively (appendix). A significant linear trend was noted for sporadic birth defects (p<0·0001), but not for familiar birth defects (p=0·95). There was no difference in the prevalence of birth defects over time between couples who had fewer or not fewer than four children (p=0·13). 25 (66%) of 38 mothers answered questions about exposure to attacks in 2008–09: two were exposed to white phosphorus, seven to bombs, and 15 to both, and one was wounded.

Interpretation Use of pedigrees of large families enables the retrospective detection of changes in the prevalence of birth defects and can enable the gathering of relevant information in the absence of previous records. This method can also enable the investigation of correlations of the birth defects with major documented environmental changes or exposures. A limitation of this method is its applicability to couples with several children. In the Gaza Strip, the trend in the increase in prevalence of birth defects began in 2005. The first documented use of air-delivered weaponry on the Gaza Strip started in 2001, and since then use of this weaponry has been a major environmental stress. Our data, in agreement with results obtained with other methods, reinforce our concern that toxic remnants of war could be a source of long-term effects on reproductive health. Further studies are warranted to ascertain the association between the accumulation of the toxic remnants and the prevalence of birth defects.

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See Online for appendix

Contributors
PM designed and undertook the study with AN. RM contributed to the study design. SS did the statistical analysis. PM wrote the Abstract with contributions from all authors. All authors have seen and approved the final version of the Abstract.

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We declare that we have no conflicts of interest.

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Waist circumference and hypertension in Palestinian women: a population-based cross-sectional survey

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Background Waist circumference and risk of morbidity have been reported to be related in some populations. However, the generalisability of the findings to populations in developing countries is not clear. Cultural and ethnic differences might affect not only waist size, but also its association with risk of morbidity. We assessed the association of waist circumference with hypertension in women from two refugee camps in the West Bank, occupied Palestinian territory (oPt).

Methods We used data from a 2001 survey about parity and risk factors for coronary heart disease in a sample of 515 Palestinian women (aged 40–65 years) from two refugee camps in the West Bank. These women were selected from the UN Relief and Works Agency for Palestine Refugees in the Near East's registration records by use of random numbers assigned to the names of all women. Trained staff did face-to-face interviews and obtained information about demographics, socioeconomic, behavioural, and reproductive health, and took measurements of weight, height, waist, and hip circumferences, and blood pressure (while seated). Fasting blood samples were taken by a laboratory technician. We used multiple logistic regression analysis to assess the association between hypertension as an outcome and behavioural and biological risk factors. We used SPSS (version 17.0) for the data analysis. The London School of Hygiene and Tropical Medicine, London, UK, provided ethics approval for this study. All women provided written informed consent.

Findings The mean age of the women was 49·4 years (SD 6·4) and their body-mass index (BMI) was 33·3 kg/m² (6·0). 355 (69%) women were obese (BMI ≥30 kg/m²); their waist circumference was 98 cm (12·0), and 432 (84%) women had central obesity (waist circumference ≥88 cm). 220 (43%) women had hypertension and 115 (22%) diabetes including those on medication. After adjustment for age, factors associated with hypertension were younger age at menarche, which had a protective effect (odds ratio 0·8, 95% CI 0·7–0·9; p=0·006), waist circumference of at least 88 cm (3·0, 1·6–5·8; p=0·001), and diabetes (1·9, 1·2–3·0; p=0·009). Married women were less likely to have hypertension than were those who were not married (0·6, 0·4–0·9; p=0·017). Household amenities, education, parity, BMI, and concentrations of cholesterol and triglycerides were not associated with hypertension (data not shown).

Interpretation Central obesity (waist circumference ≥88 cm) was a stronger predictor of hypertension than was BMI in this study. Waist circumference should be part of the routine physical examinations for all women, especially those older than 40 years in the oPt.

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Contributors
NOR was responsible for the study design and data gathering. NOR, NMEA-R, DK-S, and AK were responsible for data analysis and interpretation of the results. NOR and DK-S were responsible for writing and editing the Abstract. All authors have read and approved the final version of the Abstract for publication.

Conflicts of interest
We declare that we have no conflicts of interest.

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Environmental and public health effects of polluting industries in Tulkarm, West Bank, occupied Palestinian territory: an ethnographic study

Danya M Qato, Ruhan Nagra

Background Since the 1980s, several factories that cause pollution have been relocated from Israel to areas in the occupied Palestinian territory (oPt). Most prominent of these is Geshuri, a privately owned Israeli agrochemicals company operating in Tulkarm, West Bank, oPt. Results of several empirical studies suggest that as a result of proximity to industrial zones that house Geshuri and other factories that cause pollution, residents of Tulkarm have among the highest rates of cancer, asthma, and eye and respiratory health anomalies compared with residents in other districts. Because of the paucity of qualitative data to show the effect of polluting industries, our aim was to build a framework to understand the perceived adverse role of industrial pollution on the environment, economy, and public health of Tulkarm's residents.

Methods In this ethnographic study, participants were selected using a snowball sampling method generated from initial contacts within Tulkarm. We analysed qualitative data from in-depth, semistructured interviews of former employees of Geshuri factory (n=3), their families (n=6), and other adult residents (n=24). Participants were interviewed from June to August, 2011. Interviews were done in Arabic, audio recorded with verbal consent of the participants, and transcribed for review and analysis. Using a grounded-theory ethnographic approach and an open-coding method of data review, we reviewed both interview transcripts and the original recordings to identify key themes in perceptions of the environmental, economic, and health effects of the factories. The institutional review board of Brown University, Providence, RI, USA, approved this study.

Findings Key themes that emerged from the qualitative data analysis were that the most prominent acute health effects of industrial pollution were respiratory and psychosocial; there was a consensus that rates of cancer and asthma in Tulkarm were disproportionately higher than were those in other districts directly as a result of pollution from factories; pollution and waste produced by the industries had devastated agriculture, business, and land, and thus local economy and livelihoods of Tulkarm's residents who were reliant on the land for income; frustration at the researchers and journalists who had investigated the illegal practices by Geshuri but had yet to hold the responsible parties accountable for their actions; conflicting beliefs about whether some employees would have economic insecurity if Geshuri and similar factories should cease operation; concern about unsafe factory working conditions and violent management practices; and a long-held belief that working towards closing these factories would be a tangible affirmation of a commitment to environmental justice in the oPt.

Interpretation Most of the participants believed that the pollution caused by Geshuri has adversely affected the public health and livelihood of the community in Tulkarm. In the absence of resources required for advanced environmental epidemiological modelling, we suggest the incorporation of community voices in any effort to challenge such industries. Furthermore, gathering of rigorous environmental exposure data is warranted and should be encouraged. The main limitations of this study were the inability to ascertain the representativeness of our sample to the experience of all Tulkarm's residents; and because of the qualitative design, our inability to identify precise sources of pollution apart from that caused by agrochemical manufacturers.

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Contributors
DMQ and RN participated in the conceptualisation and design of this study. DMQ was responsible for writing the first draft of the Abstract, and the interpretation and analysis of the data. RN was responsible for acquisition and interpretation of the data. Both authors have read and approved the final version of the Abstract.

Conflicts of interest
We declare that we have no conflicts of interest.

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Midwives' and women's views of childbirth in the Gaza Strip, occupied Palestinian territory: an exploratory study

Itimad Abu Ward

Background In a quality-of-care assessment of mothers and newborn babies in maternity units in the Gaza Strip, occupied Palestinian territory (oPt), WHO oPt identified poor management of normal childbirth, early discharge, and lack of privacy for women as challenges for the delivery of care to pregnant women. The Palestinian Ministry of Health agreed that these challenges could be addressed by the introduction of a midwifery-led model of care. The aim of this study was to solicit the views of staff and women who had been through childbirth with respect to the introduction of the midwifery-led model of care.

Methods Six focus groups were organised and each group consisted of eight to 12 health professionals (midwives, nurses, or doctors). Selection criteria for the health professionals were experience in midwifery-led model of care and working in a maternity unit of one of the main hospitals in the Gaza Strip. Two focus groups had midwives, two had male and female obstetricians, one had nurse managers, and one had primary health-care midwives and doctors. Three other focus groups were formed with women who had given birth at any time in their lives. Thematic analysis was used to identify themes and subthemes to form the basis for the analysis, and NVivo (version 8) was used to code and emerge themes and subthemes. The Ministry of Health provided the approval to do the study. All participants provided verbal informed consent.

Findings Midwives stated that they lacked training in evidence-based practice. The consensus opinion of the doctors was that normal childbirth is the responsibility of midwives, and they mentioned that the midwives needed training. Managers stated that midwives with a postgraduate education could cope with the increased responsibility, but new graduates needed additional training. Professionals working in primary health care recommended better documentation in the mother–child handbook. Most women said that they preferred women to care for them during childbirth; however, they could not differentiate between midwives and female doctors, and claimed they were not kept well informed about progress and did not have sufficient support during childbirth.

Interpretation Before the midwifery-led model of maternity care can be introduced in the Gaza Strip, midwives need to be given additional training so that they can focus on their core responsibility. The health-care system will assist midwives to respond to these challenges to improve the continuity of care.

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I declare that I have no conflicts of interest.

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Use of medicines in communities of Palestinian refugees: a mixed-methods study

Dima M Qato

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Background Little is known about medication use in refugee communities, including for individuals who are under the care of the UN Relief and Works Agency for Palestine Refugees in the Near East (UNRWA) in Jordan. We therefore assessed how perceptions and knowledge about health and medicines affect treatment decisions for households, primarily mothers, in refugee communities.

Methods We undertook semistructured household interviews and a questionnaire-based survey of customers who sought to purchase medications from private pharmacies between 2002 and 2003, in UNRWA's Baqa'a and Wihdat refugee camps in Jordan. Our convenience sample consisted of 15 households and two private pharmacies. We analysed the information from the household interviews using a qualitative case-study method. 70 customers (any age or sex) who sought to purchase a medication from a private pharmacy with or without a prescription completed the survey. Questionnaire items were derived from WHO's guidelines for the assessment of medication use in the community. Data were analysed with Microsoft Excel (version 10). Approval to undertake the study was obtained from UNRWA, Amman, Jordan. Households and survey respondents provided verbal informed consent.

Findings Seven (10%) of 70 customers were privately insured, 35 (50%) self-medicated, and 67 (96%) did not seek advice from a pharmacist. Customers purchased a mean of 2·3 (range 1–6) unique medications from private pharmacies. Consumers and households preferred branded rather than generic medications despite the differences in costs. Households showed a preference for private physicians and pharmacies rather than UNRWA as their source of clinical and pharmacy services, respectively. 12 (80%) of 15 households had at least one case of inappropriate medication use, particularly the overuse of antibiotics and underuse of medications for chronic disease. 50 (15–120) expired and valid medications were stored at home by households and were mainly used by mothers and their children. The medications for chronic disease, specifically diabetes mellitus and hypertension, were often taken at the onset of symptoms and not as prescribed.

Interpretation The use of medicines is widespread in the Palestinian refugee communities in Jordan, and medications are often used inappropriately. The results from this study provide strong evidence that the inappropriate use of some medications might be contributing to premature morbidity and mortality, especially in women and children. These findings suggest that community-based assessments and interventions are necessary to improve the use of medicines in these communities.

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Disability and food insufficiency in the Palestinian refugee population in Lebanon: a household survey

Nisreen Salti, Nuha Nuwayri-Salti, Hala Ghattas

Background According to the available data, Palestinian refugees in Lebanon have higher disability rates (4·4% in 2010) than do the Lebanese population (2·0% in 2004), and the Palestinian population in the occupied Palestinian territory (2·7% in 2011). However, the sociodemographic characteristics of the Palestinian refugees with disabilities are still not known. In this study, we describe their sociodemographic profile by type and cause of disability, and quantify the risk of disability associated with food insufficiency.

Methods Data for 2631 households, including their socioeconomic and demographic characteristics, health, disability, food consumption, and food security, were from the 2010 Socio-Economic Survey of Palestine Refugees in Lebanon. Missing data for individual variables resulted in reduced sample sizes in bivariate analyses. We did not impute missing values and report findings with available data. Using Stata (version 10.0), we regressed household food consumption on disability, controlling for geographical region, household size, age composition, wealth, expenditures, sex and education of the head of the household, chronic illnesses, and participation in social assistance programmes. We also undertook multinomial logistic regression of disability by cause—food insufficiency and food security. Food security was assessed with a six-item food security scale adapted from the US Household Food Security Survey Module and the Yemen National Food Insecurity and Vulnerability Information and Mapping Systems Survey, and modified to the context of refugees living in Lebanon. Food insufficiency was defined as a positive response to a threshold question from the food security scale: "The food that we bought did not last and we didn't have money to buy more?" We regarded "most of the time" and "sometimes" as a positive response. The household survey was approved by the institutional review board of the American University of Beirut, Beirut, Lebanon. We obtained verbal informed consent from the household proxy respondent who responded to the questionnaire.

Findings 402 (15%) of 2631 Palestinian households had a member with a disability. 302 (64%) of 475 individuals with a disability were men (*vs* 4810 [46%] of 10 458 able-bodied individuals), and 260 (55%) of 470 with a disability had a chronic illness (*vs* 3096 [30%] of 10 418 individuals without a disability). 92 (29%) of 320 cases of disability were due to birth defects, 66 (21%) to accidents, 56 (18%) to war, 27 (8%) to work, and 79 (25%) to other causes. The sex distribution in the 24% of individuals with a disability due to other causes was less skewed than in those with a disability due to birth defects, accidents, or work (41 [53%] of 77 were men *vs* 175 [73%] of 241, respectively). The prevalence of chronic illnesses was higher in people with a disability caused by disease who were younger than 65 years than in those older than 65 years (35 [78%] of 45 *vs* 121 [50%] of 242). Regression analysis showed that disability of any cause was significantly associated with food insufficiency (p=0·023) and insecurity (p=0·008). However, food insufficiency was associated with a significantly higher risk of disability only when the disability was due to disease (p=0·05).

Interpretation Our findings confirm the impoverishing effect of disability irrespective of the cause. Food insufficiency was associated with disability only when the disability was caused by disease. Interventions to ensure food sufficiency and adequate nutrition can play a part in the prevention of disability in the Palestinian refugee population and break the cycle of poverty, poor nutrition, and poor health.

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NN-S and NS identified the research questions. HG constructed the indicators for food insufficiency and food insecurity and provided their interpretation. NS did the statistical analysis and wrote the Abstract with input from NN-S and HG. All authors have seen and approved the final version of the Abstract for publication.

Conflicts of interest

We declare that we have no conflicts of interest.

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Seawater intrusion into the coastal aquifer in the Gaza Strip: a computer-modelling study

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Background Climate change is transforming life on earth, as seasons shift, rainfall decreases, and temperatures increase. Rising sea levels and overpumping are causing seawater intrusion into the coastal aquifer. This problem acutely affects people living in the occupied Palestinian territory (oPt), and is worst in the Gaza Strip, where the coastal aquifer is the region's only freshwater resource and is therefore insufficient for the needs of the population. This aquifer has already been degraded by over extraction, infiltration of sewage, and seawater intrusion, contributing to high rates of waterborne diseases in the Gaza Strip. The Israeli authorities tightly control the quantity of water from the aquifer that Palestinians in the Gaza Strip can extract. Palestinians in the oPt receive less than the WHO recommendation of 100 L/day per person. An Israeli citizen uses 250 L/day, whereas a Palestinian citizen uses 66 L/day. Seawater intrusion into the Gaza Strip's northern coastal aquifer was predicted with computer modelling to show the potential effects of climate change and human overuse on the region's only freshwater source.

Methods A simulation of seawater intrusion into the coastal aquifer into the northern part of the Gaza Strip was done with SEAWAT, a computer program developed by the US Geological Survey for simulating the three-dimensional variable density groundwater flow in porous media with multispecies solute transport. This program was used to analyse the groundwater flow and transport, water replenishment rates, and extraction quantities with projected rises in the sea level. The simulation enables prediction of inland seawater intrusion rates and chloride concentrations in the abstraction wells for the next 35 years.

Findings Various scenarios were simulated to study the effects of climate change on seawater intrusion due to rises in the sea level, and variations in replenishment and pumping rates at the study area. The current rate of seawater intrusion into the coastal aquifer is 65 m/year. Computer-modelled scenarios with SEAWAT of future low replenishment rates predict worst-case-scenario intrusion rates of about 80 m/year by the end of the study in 2035. The best computer-modelled prediction of 35 m/year intrusion was obtained with solutions proposed in the management scenario by the local water authorities to reduce the water deficit and remove water salinity in the aquifer.

Interpretation Seawater intrusion can jeopardise the groundwater resources for coastal communities such as those living in the Gaza Strip, putting them at risk of waterborne diseases. The best management of seawater intrusion would be to apply desalination technology and improve the efficiency of existing waste-water treatment plants for water recycling and subsequent reuse. These methods will become increasingly important as climate change negatively affects the aquifer and population demand increases.

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Contributors
RS conceptualised the data gathering and model analysis, did the data interpretation and literature search, and wrote the Abstract. MNA supervised the data gathering and reviewed the literature. Both authors interpreted the findings, and reviewed and edited the drafts of the Abstract.

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We declare that we have no conflicts of interest.

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Salt reduction as a population-based intervention for the prevention of coronary heart diseases: an economic assessment

Azza Shoaibi, Rula Ghandour, Rana Khatib, Helen Mason, Martin O'Flaherty, Simon Capewell, Abdullatif Husseini

Background The incidence of coronary heart diseases is increasing in the occupied Palestinian territory (oPt) and hence poses a growing challenge for treatment. Reduction in the intake of dietary salt is a potentially cost-effective approach to reduce the burden of coronary heart diseases. Here, we report the results of an economic assessment of three interventions of salt reduction in the oPt.

Methods We did the analysis from a societal perspective of three salt-reduction interventions—population-wide health promotion campaigns, mandatory labelling of food packaging, and mandatory reduction of salt content of processed food. These interventions were assessed individually, and in combinations of two and all three together. We estimated the costs of policies using past experiences, expert opinion, and hospital records, and costs of health care with a standardised unit cost for treatments. We considered the financial implications for the food industry and public sectors. The total cost of implementation of each policy was compared with the do-nothing scenario. We used data reported in reviews of epidemiological studies as estimates of the expected reduction of the current sodium salt consumption attributable to each policy. The expected change in salt intake was then converted into a change in mean population blood pressure based on estimates reported in a meta-analysis. The change in blood pressure was used to estimate the number of deaths prevented or postponed in 10 years, using the Palestinian IMPACT policy model for coronary heart disease. The estimates were compared with the number of deaths from coronary heart disease that would have been expected in relation to the number in the baseline year. This policy model is an epidemiological model that was used to analyse mortality associated with coronary heart disease and risk factor trends in the West Bank, oPt, between 1998 and 2009, and project mortality trends for the future. We used Microsoft Excel 2010 for our analyses.

Findings All policies resulted in a reduction in salt intake of 5–30%, leading to changes of 1–20 mm Hg in systolic blood pressure. All scenarios were cost effective compared with the do-nothing scenario. The cost-effectiveness of the scenarios for per life-year gained was $134·57–1430·62 (purchasing power parity at 2010 exchange rates). Policies for the labelling of food and use of the three interventions together were the most cost effective. These two scenarios were estimated to save costs ($9 million and $6 million) and resulted in 945 life-years gained and 2682 life-years gained, respectively.

Interpretation Reduction of salt intake reduces the long-term burden of coronary heart diseases. In the oPt, population-based interventions to reduce salt intake are not only cost effective but also cost saving. We recommend a population-wide health promotion campaign, mandatory labelling of food packaging, and mandatory reduction of salt content of processed food.

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Contributors
AS contributed to the study design, helped in the data analysis, and wrote the first and final drafts of the Abstract. All co-authors contributed to the conceptualisation, design, and data analysis, and reviewed and commented on the Abstract.

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Child discipline in the occupied Palestinian territory: a cross-sectional study

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Background Negative disciplinary methods (NDMs), including corporal and verbal punishment, are often used in the occupied Palestinian territory (oPt) and are reported to be used on 94·5% of children aged 2–14 years. Because such practices can negatively affect the psychological and physical development of children, the factors associated with the use of NDMs by parents in the oPt were investigated.

Methods Nationally representative data from the Pan Arab Project for Family Health (PAPFAM) Survey 2006, which had a section on child discipline, were obtained from the Palestinian Central Bureau of Statistics. For this survey, data was gathered from a representative sample of households in the oPt by random-cluster sampling. A questionnaire had been used to obtain information from mothers or other female members of the household about the disciplinary methods used, including types of verbal and physical abuse. Our analysis for this cross-sectional study focused on questions about child rearing and discipline. The relation between sociodemographic variables (child's age and sex, parents' education, and family's wealth status) and NDMs was assessed with bivariate analysis in SPSS (version 17.0), and regression analysis of the significant associations.

Findings The 2006 PAPFAM survey included 13 238 households, with a response rate of 88% (11 661 households). One child aged 2–14 years was selected from each household having children in this age group (4552 households). 2578 (57%) of 4552 children were exposed to the use of fewer than three NDMs, whereas 1974 (43%) to three or four (this split in the NDMs was used in the initial data analysis). Results from the regression analysis showed that girls were less likely to be exposed to NDMs than were boys (three or four NDMs: 916 [40%] of 2276 girls *vs* 1057 [47%] of 2271 boys; odds ratio 0·79, 95% CI 0·70–0·90) and children in the economically and politically unstable Gaza Strip were more likely to be exposed to NDMs than were those in the West Bank, oPt (1·42, 1·25–1·62). Families who were financially better off (0·69, 0·57–0·83) and mothers (0·77, 0·61–0·96) and fathers (0·76, 0·63–0·91) who were more educated were less likely to use NDMs than were those who were not.

Interpretation Poverty seems to be a strong factor for the use of NDMs by parents. The findings of this study draw attention to the importance of engaging boys and their families who have a low income in interventions to prevent the use of NDMs and to help individuals to cope with the consequences of these practices.

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Contributors
All authors contributed to the conceptualisation of the study, and participated in data analysis and writing the Abstract.

Conflicts of interest
We declare that we have no conflicts of interest.

Prenatal and postnatal care of gestational diabetes and gestational hypertension in clinics for high-risk pregnancies in the West Bank, occupied Palestinian territory: a follow-up comparative study

Ibtisam Titi, Nuha El Sharif

Background The prevalence of gestational diabetes and hypertension and the adverse outcomes associated with them are increasing worldwide. Appropriate prenatal care is thought to reduce adverse outcomes for mothers and infants. We describe and evaluate data for high-risk pregnancies in the clinics of the Palestinian Ministry of Health, Hebron, West Bank, occupied Palestinian territory (oPt), especially prenatal care related to gestational hypertension and gestational diabetes.

Methods We evaluated data from all files of women (n=600) who were registered at the six main high-risk pregnancy clinics from Jan 1, to Dec 31, 2009, to estimate the prevalence of gestational diabetes and gestational hypertension. From Oct 1, 2010, to Jan 31, 2011, we followed up all women (n=60) who had gestational diabetes or gestational hypertension during their pregnancy and delivery of their baby in 2009. Every tenth file from files of women (n=60) needing antenatal or postnatal care were randomly selected as a comparative group. The women were interviewed with a questionnaire. Data analyses were done with SPSS (version 16.0) and the results were judged to be significant if the p value was less than 0·05. The graduate studies committee at Al-Quds University, East Jerusalem, West Bank, oPt, provided approval for the study. All women provided written informed consent.

Findings In 2009, 25 (42%) of 60 women with gestational hypertension and gestational diabetes who were followed up had gestational diabetes, 24 (40%) had gestational hypertension, and 11 (18%) had both. In 2010, 17 (68%) of 25 women with gestational diabetes still had diabetes after the pregnancy, 17 (71%) of 24 with gestational hypertension still had hypertension, and eight (73%) of 11 with both still had both diabetes and hypertension. 25 (42%) of 60 women had not visited a doctor after the birth of their baby; 14 (56%) of 25 women still had hypertension and diabetes: four (29%) of 14 still had diabetes, six (43%) still had hypertension, and four (29%) still had both. None of the 60 women had an oral glucose tolerance test, urine test, or lipid profiling after delivery. We noted significant differences in the frequencies of complications between cases and the comparison group. Major complications included vision problems (25 [42%] of 60 *vs* zero; p=0), eclampsia (12 [20%] *vs* two [3%]; p=0), and diabetic coma (eight [13%] *vs* zero; p=0). Minor complications included vaginal bleeding (15 [25%] of 60 *vs* eight [14%]; p=0), dizziness (46 [77%] *vs* nine [16%]; p=0·001), extremities swelling (35 [59%] *vs* five [9%]; p=0·001), and digestive tract disturbance (11 [19%] *vs* one [2%]; p=0). Infants born to mothers with gestational hypertension or gestational diabetes had a higher frequency of complications than did those born to mothers in the comparison group—eg, hypoglycaemia (23 [40%] of 58 infants born to the cases *vs* two [4%] of 56 infants born to women in the comparison group; p=0·001), low haemoglobin concentrations (24 [41%] *vs* four [7%]; p=0), neonatal jaundice (20 [34%] *vs* six [11%]; p=0·002), macrosomia (11 [19%] *vs* one [2%]; p=0·001), and low oxygen at birth (13 [22%] *vs* three [5%]; p=0·008).

Interpretation The results of our study emphasise the need for prenatal and postnatal services specifically for these high-risk disorders and the associated complications. Because Palestinian Ministry of Health clinics do not have a written protocol or guidance to help care providers in managing or screening gestational hypertension and gestational diabetes, strategies and protocols are needed for prenatal and postnatal care of pregnancy disorders and the associated outcomes in mothers and infants.

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IT gathered and analysed the data with the supervision of NEL. IT wrote the Abstract with the assistance of NES.

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Incidence of congenital heart disease in Palestinian children born in the Gaza Strip, occupied Palestinian territory: a cross-sectional study

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Background Congenital heart disease is the most frequent form of congenital anomaly in newborn infants, and accounts for more than a quarter of all serious congenital anomalies worldwide. Generally, an estimated incidence of eight cases of congenital heart disease per 1000 livebirths is internationally accepted as the best approximation. The causes of most congenital heart defects are not known. This study was designed to estimate the birth incidence of children with congenital heart disease born in the Gaza Strip, occupied Palestinian territory, during 2010, and to compare this estimate with estimates from west Europe, North America, and Asia.

Methods We reviewed the medical records of all children born in 2010 who were diagnosed, treated, or followed up in the four paediatric cardiology clinics in the Gaza Strip. Data were also obtained from other medical centres to which some of our patients were referred for percutaneous or surgical treatment. Patients were excluded if they had isolated patent foramen ovale; rhythm disturbances without structural defects; isolated mild peripheral pulmonary stenosis; isolated innocent patent ductus arteriosus; patent ductus arteriosus (preterm infants); hereditary disorders without cardiac consequences; or malpositioning of the heart without structural defects. Systematic echocardiographical screening of the entire population is not done, so subclinical heart defects, such as subclinical ventricular septal defect, mild pulmonary valve stenosis, or small atrial septal defect will have been missed. Babies who died perinatally or after birth before diagnosis in the Gaza Strip are not examined at post mortem. The study was approved by the human research ethics committee, Ministry of Health, Gaza Strip. Data were analysed with Microsoft Excel 2007. Because existing data were used, informed consent was required from the parents or guardians of the children.

Findings Congenital heart disease was detected in 598 of 59 757 children who were born alive in the Gaza Strip during 2010, giving an incidence of ten per 1000 livebirths. 334 (56%) of 598 children were girls and 264 (44%) were boys. The most frequent anomalies were ventricular septal defects (167 [28%]), ostium secundum atrial septal defects (101 [17%]), patent ductus arteriosus (52 [9%]), and pulmonary valve abnormalities (48 [8%]). 150 children (25%) had a cardiosurgical operation and 48 (8%) had a catheter intervention. 42 (7%) children died. At ages 6 months and 1 year, 562 (94%) and 556 (93%) children were alive, respectively, and remained stable during 18 months of follow-up.

Interpretation The results of this study are relevant not only for clinicians and hospital administrators, but also for public health in the Gaza Strip. Furthermore, the findings can be used for a longitudinal follow-up of the cohort of patients in this study to ascertain progress and outcomes of patient management.

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Conflicts of interest
We declare that we have no conflicts of interest.