radiographic investigations did not benefit patients. Radiology staff enforced the guidelines that were issued to other staff in September 1992 and also rejected request cards on which the only information provided was "pre-op." The rate of requests for preoperative chest radiography fell from 24% to 7%, which represents an annual reduction of nearly 3500 examinations. We can monitor the rate of preoperative chest radiography easily, using computers both in the radiology department and in the operating theatres; we intend to keep the rate at or below 7%.

We thank our radiography and clerical colleagues for their essential contribution.

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Later effects of grounding of tanker *Braer* on health in Shetland

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The public health response to the oil spillage from the tanker *Braer* in January 1993 included a cohort study to examine its effects on health.[1] The first phase has been reported.[2] We report longer term effects.

Subjects, methods, and results

In June 1993 participants in the first phase were given an extended questionnaire. A systematic sample of non-participating exposed people was surveyed by telephone. Participants aged 16 and over completed the general health questionnaire (28 questions).[3] Weight, peak expiratory flow, urine analysis, haematology, and liver and renal function were measured. For categorical data χ^2 values or Fisher's exact tests with two tailed probability were computed; testing of hypotheses was performed by determining odds ratios and confidence intervals by using discordant pairs when applicable. For continuous data, means and mean differences for paired data and their 95% confidence intervals were calculated.

Overall, 344 of the original 420 subjects (80%) and 77 of the 92 controls (84%) participated. The distribution of sex and age and the proportions exposed inside and outside were no different from the first phase. Sixteen of the 76 (21%) non-responders surveyed did not differ in distributions of sex and age from participants. Of exposed people, 7% (25/334) perceived their health to be poor compared with none of the 77 controls ($\chi^2=8{\cdot}05$, df=3, $P<0{\cdot}05$). Significantly more considered it to have altered since the incident, 16% (54/334) reporting deterioration and 2% (7/334) improvement whereas only 3% (2/77) of controls described deterioration ($\chi^2=11{\cdot}80$, df=1, $P<0{\cdot}001$). Of exposed people, 6% (21/334) attributed the change to the *Braer*, with 3% (9/334) reporting both poor health and a decline in health; the remainder, though reporting deterioration, still considered it to be good.

Comparison of the symptoms of exposed people in the two weeks before this phase with their presence immediately after the incident showed more tiredness (odds ratio 1·86, 95% confidence interval 1·19 to 2·92) and fever (2·25, 1·14 to 4·44), fewer throat (0·45, 0·31 to 0·66), skin (0·38, 0·20 to 0·70), and eye irritations (0·18, 0·10 to 0·32), and fewer headaches (0·55, 0·36 to 0·83). More controls had tiredness (4·00, 1·13 to 14·17) and headaches (5·50, 1·22 to 24·81) in June than after the event. In June exposed people were more likely to report throat irritation (3·37, 1·33 to 9·05) and breathlessness on exertion (4·81, 1·09 to 29·92) in the previous 14 days. A greater proportion of those exposed reported weakness (9·18, 1·32 to 182·96) at some time over the five months (table). Eighty six per cent (31/36) declared these symptoms to be persisting, with one third describing their onset in January. There were no differences in perception of health and onset of symptoms between the non-responders and participants.

The mean general health questionnaire score of those exposed (2·92, 2·33 to 3·50) was significantly greater than that of controls (0·83, 0·25 to 1·41). A greater proportion of exposed subjects (60/254, range 0-25) was above the threshold score compared with controls (2/59, range 0-13) ($\chi^2=9{\cdot}15$, df=1, $P<0{\cdot}003$). The mean scores for those exposed inside (2·71, 2·05 to 3·37) or outside (3·42, 2·27 to 4·61) did not differ. Those exposed had greater overall scores compared with controls for somatic symptoms (1·15 (0·92 to 1·38) *v* 0·29 (0·10 to 0·48)) and anxiety and insomnia (0·83 (0·63 to 1·03) *v* 0·19 (0·02 to 0·36)) but not for personal dysfunction and severe depression. Among the biological markers examined only aspartate aminotransferase activity was different between the two phases (0·40 (−0·38 to 1·18) *v* −179 (−2·83 to −0·76)) but not between type of exposure.

Numbers of people reporting symptoms with onset since Braer incident by type of exposure

Symptom	Exposed (n=334)	Controls (n=77)	Odds ratio (95% confidence interval)	Exposure: Inside (n=252)	Exposure: Outside (n=82)	Odds ratio (95% confidence interval)
Bruising	10	2	1·16 (0·23 to 7·82)	8	2	1·31 (0·25 to 9·14)
Infections	44	7	1·52 (0·62 to 3·86)	32	12	1·04 (0·48 to 2·27)
Unsteadiness	12	1	2·83 (0·37 to 59·19)	9	3	0·98 (0·23 to 4·67)
Weakness	36	1	9·18 (1·32 to 182·96)	25	11	0·71 (0·32 to 1·63)
Cramps	18	2	2·14 (0·46 to 13·63)	12	6	0·63 (0·21 to 1·97)
Eyesight problems	11	2	1·28 (0·26 to 8·53)	10	1	3·35 (0·43 to 70·95)
Work affected	4	2	0·45 (0·07 to 3·64)	2	2	0·32 (0·03 to 3·23)
Wheezing	20	1	4·84 (0·67 to 98·34)	13	1	0·58 (0·21 to 1·68)
Breathless at rest	7	1	1·63 (0·20 to 35·78)	3	4	0·23 (0·04 to 1·27)
Breathless on exercise	13	1	3·08 (0·41 to 63·98)	9	4	0·72 (0·20 to 2·87)

Comment

Any overreporting of self reported symptoms would tend to magnify possible health effects. Although the drop out rate between the two studies was appreciable, the telephone survey showed no differences in demography, symptoms, or exposure. The health of exposed participants and controls was similar, though probable upper respiratory infection was detected. A greater proportion of exposed people considered their health to have deteriorated, but only nine reported it as poor because of the incident.

The finding that both groups were more tired in June and the greater proportion of exposed people reporting weakness are unexplained. Whether a physical abnormality is being measured is arguable as only four people reported problems with work. The few women who were pregnant or conceived during the incident delivered without adverse outcomes (M Hunter, C Rowlands, personal communication).

Human disasters are recognised as causes of long

term mental illness and community disruption.[4] The general health questionnaire detects psychiatric disorders in community settings.[3] Of those exposed, 24% scored above the level at which a subject could be considered a case compared with 3% of controls. This was not related to potential level of exposure and may be in response to strains on the fabric of this community.

The results of this phase of the study were presented to the people of the South Mainland of Shetland at a public meeting held on 13 September 1993.

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Circadian variation in attempted suicide by deliberate self poisoning

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Circadian patterns have been shown for many physiological variables and several medical diseases.[1] Suicidal behaviours usually occur with symptoms of depression, although only a few people who attempt suicide fully satisfy diagnostic criteria for having an affective disorder. Clinical and experimental evidence suggests that affective disorders are related to disturbances in the phase or amplitude of biological rhythms—for example, sleep-wake cycles, environmental dark-light cycles, and hormonal rhythms. We determined whether a specific temporal risk exists in the occurrence of attempted suicide by deliberate self poisoning.

Patients, methods, and results

We studied prospectively all patients who attempted suicide by deliberate self poisoning and were admitted to the accident and emergency department of St Anna Hospital, Ferrara, Italy, from 1 January 1989 to 31 December 1991. This hospital alone deals with medical emergencies occurring in the city and suburban area of Ferrara (about 150 000 residents).

Attempted suicide by deliberate self poisoning was diagnosed from the clinical history (from relatives, witnesses, or the patients themselves), physical examination, and response to the benzodiazepine flumazenil. In most cases the presumptive diagnosis was then confirmed by specific toxicological assay. All patients were interviewed by a consultant psychiatrist, who recorded demographic characteristics, the nature of the drugs or substances ingested, and the time of ingestion.

Seventy one patients were men (mean age 41 (SD 18)) and 141 women (mean age 39 (17)). Ninety eight patients had taken benzodiazepines, 10 antidepressants, six neuroleptics, four barbiturates, 10 sodium hypochlorite and 29 other drugs; 32 had taken a mixture of drugs and data were not available for 22.

The time of self poisoning was categorised into 24 increments of one hour, 0600 to 0659 being classed as 6 am (table). Data in the group as a whole and by sex were analysed by cosinor analysis, in which the cosine curve best fitting the data was determined by multiple linear regression.[2] For rhythms detected by rejection of the zero amplitude hypothesis (at $P < 0.05$), the cosinor procedure yields (*a*) the rhythm adjusted mean (or mesor), which measures the extent of the rhythm; (*b*) the amplitude (the distance from the mesor to the peak or trough of the cosine curve best fitting the data); and (*c*) the acrophase (peak time of the cosine curve best fitting the data). Each of the values has an estimate of variance.

Distribution of attempts at suicide by time

Time	Men (n=71)	Women (n=141)	Total (n=212)
0000-0059	5	5	10
0100-0159	3	4	7
0200-0259	1	5	6
0300-0359	2	0	2
0400-0459	0	4	4
0500-0559	1	1	2
0600-0659	1	1	2
0700-0759	2	3	5
0800-0859	2	3	5
0900-0959	3	7	10
1000-1059	2	10	12
1100-1159	3	4	7
1200-1259	4	9	13
1300-1359	4	12	16
1400-1459	1	2	3
1500-1559	3	7	10
1600-1659	3	5	8
1700-1759	4	3	7
1800-1859	2	11	13
1900-1959	6	7	13
2000-2059	8	15	23
2100-2159	6	10	16
2200-2259	3	6	9
2300-2359	2	7	9

A significant circadian rhythm was found for the whole population ($P=0.007$, mesor 8·83) and for men ($P=0.007$, mesor 2·86) and women ($P=0.026$, mesor 5·87). The acrophases were respectively 1745 (95% confidence interval to 1432 to 2258), 1837 (1537 to 2148), and 1716 (1303 to 2129).

Comment

The sociodemographic data on our sample were consistent with published data. In particular, women attempting suicide outnumbered men by two to one. This might indicate women's greater demonstrative tendency as men outnumber women by two to one in studies of completed suicide.

Our results suggest that the risk of attempting suicide by self poisoning is greatest in the early evening, which is in agreement with previous studies.[3] The risk of suicide is greatest during the late morning