Mortality from occupational accidents to United Kingdom fishermen 1961–80

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ABSTRACT After the catastrophic losses of three Hull deep sea trawlers in 1968, the Committee of Inquiry into Trawler Safety (CITS) was established. Fourteen months later, CITS reported on factors affecting the safety of deep sea trawlers and their crews. Pre-CITS (1961–70) and post-CITS (1971–80) crude mortality rates for accidents at work are compared for “deep sea” fishermen (those working on vessels $\geq 24.4$ m (80 feet) registered length) and “inshore” fishermen (those working on vessels $< 24.4$ m). The ratio of deep sea to inshore fishermen had changed from 1:1.5 (1961) to 1:7.0 (1980), reflecting the radical restructuring of the fishing fleet that began in the early 1970s. Between 1961 and 1980, there were 909 recorded deaths at sea of United Kingdom fishermen. Of these, 711 (78%) were due to accidents (either from vessel losses or personal accidents) and 198 (22%) were due to unspecified disease, homicide, and suicide. Comparison of pre-CITS and post-CITS mean death rates showed an increase (+39%) for deep sea fishermen, a decrease (−4%) for inshore fisherman, and an increase (+2%) for both combined. For deep sea fishermen, there were synchronous increases in mortality from vessel losses (+32%) and from personal accidents (+49%, $p < 0.05$) whereas the overall rate for inshore fishermen reflected a decrease (−33%, $p < 0.01$) in deaths from personal accidents but an increase (+52%) in deaths from vessel losses. Although pre-CITS mortality rates exhibited no statistically significant difference between deep sea and inshore fishermen, the post-CITS accident mortality rate for deep sea fishermen was significantly greater ($p < 0.02$). Compared with coal miners, fishermen were, on average, four times more likely to die from accidents at work. If CITS had reasonable cause for concern in 1969, the grounds for similar concern did not diminish because the evidence suggests that deep sea fishermen were at no lesser risk of death from accidents after CITS reported than before. Overall, both groups of fishermen experienced an accident mortality rate between 1961 and 1980 that showed no indication of improvement.

The mortality from occupational accidents to United Kingdom fishermen was suspected by Tunstall of being higher than that of other occupations more than 20 years ago, but it was only in 1965, when Schilling described trawler fishing as an “extreme occupation,” a description also used by Tunstall, that the nature of specific hazards appeared in partial focus. It was not until 1969, however, after publication of the final report of the Committee of Inquiry into Trawler Safety (CITS), that the extent of the excess mortality experience of deep sea fishermen was finally confirmed.

Schilling’s contention that trawler fishing was an extreme occupation stemmed almost inadvertently from his personal exposure to actual working conditions on board a trawler while investigating the aetiology and considering the prevention of allergic contact dermatitis. His experience of the hazards to which fishermen were exposed routinely, drove him to make the plea that action “... be taken to make fishing ... a safer occupation.” These words were overtaken by events when in January and February 1968 three Hull deep sea trawlers (St Romanus, Kingston Peridot, and Ross Cleveland) were lost off northern Iceland and in the Norwegian Sea within 26 days. Fifty eight fishermen died. The causes and circumstances of human and vessel losses have been described elsewhere.

The political outcry in the House of Commons and the expressions of wider public concern compelled the then President of the Board of Trade to appoint a committee to examine the major factors affecting the safety of deep sea trawlers and their crews and to
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make recommendations. Under the chairmanship of Admiral Sir Deric Holland-Martin, the Committee of Inquiry into Trawler Safety was set up in March 1968, issued an interim report within six months, and completed its final report to the Board of Trade by May 1969.

The CITS report was one of the most comprehensive and thorough examinations of occupational safety in the deep sea sector of the industry and was, as Hunter concluded, one of the most sweeping indictments of any British industry this century. The recommendations of the report were acknowledged in part and primary legislation, the Fishing Vessels (Safety Provisions) Act 1970, was soon passed. After consultation with the fishing industry between 1972 and 1974, the provisions of the 1970 Act became practical guidelines and were published in 1975 as the Fishing Vessels (Safety Provisions) Rules 1975. These rules, it was claimed, marked a tremendous advance and showed the Government’s determination to set statutory standards and to ensure that these were observed. Whereas the CITS recommendations were directed to vessels of ≥ 24.4 m (80 feet) registered length, these rules extended to all vessels of ≥ 12 m (40 feet) registered length. This initial activity relating to the safety of vessels per se was augmented in 1975 by the Report of the Working Group on Discipline in the Fishing Industry; in 1978 by the Recommended Code for Safety for Fishermen; and in 1979 by the Report of the Working Group on the Occupational Safety of Fishermen.

CITS was concerned exclusively with deep sea vessels and fishermen. Apart from a limited confidential report prepared by the former White Fish Authority (Industrial Development Unit) on behalf of the former Herring Industry Board, no investigation comparable with that undertaken by CITS was commissioned for inshore vessels despite the numerically larger fleet. Nevertheless, many of the CITS recommendations were relevant and applicable to the safety of inshore vessels and fishermen.

Safety audit

Shortly after publication of the CITS report, Schilling considered that since the true facts (relating to mortality) had emerged, more effective action had been taken. That more action had been taken is undeniable but the effectiveness of this action on safety standards has, in the case of fishing vessels, only recently been evaluated. Retrospective analysis of the total loss and serious casualty rate (TL/SC Rate) for United Kingdom fishing vessels between 1961 and 1980 showed a gradual and sustained increase. The post-CITS mean was 69% higher than the pre-CITS value (p < 0.001) and much of this increase was due to a concomitant increase in founderings (loss of watertight integrity).

So far as mortality is concerned, however, no systematic assessment of fatal accidents to all United Kingdom fishermen (deep sea and inshore) has been undertaken before. No “audit” has been conducted, possibly because baseline mortality data for monitoring trends are less consistent than expected and morbidity data are virtually non-existent.

The present paper provides a quantitative evaluation of mortality from occupational accidents sustained by deep sea and inshore fishermen between 1961 and 1980, tests the hypothesis that post-CITS (1971–80) accident death rates (deep sea, inshore, and both groups) differed from pre-CITS (1961–70) rates, and compares the mortality experience from accidents to deep sea fishermen with that of inshore fishermen.

Methods

DATA SOURCES AND TECHNIQUES

Numerator data were obtained from official publications produced annually or biennially: Shipping Casualties and Deaths (1961–71) and Casualties to Vessels and Accidents to Men (1972–80). These were compiled from data collected by the Registrar General of Shipping and Seamen (RGSS) in Cardiff. Before 1972, only deep sea deaths and total deaths were itemised; no separate listing of inshore deaths was produced. Nevertheless, pre-1972 deaths in the inshore fishing sector may be obtained by subtracting the numbers of deep sea deaths from total recorded deaths of fishermen at sea for each year from 1961 onwards.

Denominator data were obtained directly from the Ministry of Agriculture, Fisheries, and Food (MAFF) for England, Wales, and Northern Ireland and from the Department of Agriculture and Fisheries for Scotland (DAFS). The denominator, or estimated population of fisherman at risk (EPFR), was defined, in this study, as the sum of full time and part time fishermen employed on United Kingdom registered vessels. Two part time fishermen were considered equivalent to one full time fisherman. This EPFR differs from that used by the Department of Trade (now Transport) which is defined as “the total number of berths (bunks) available in the operational group.” The “official” EPFR was considered to be unsatisfactory for two reasons. Firstly, because no EPFR, and therefore no rate, had been calculated for inshore fishermen until 1977 it was impossible to make an adequate comparison of both deep sea and inshore death rates before that date. Secondly, defining a population at risk based on the number of sleeping places available on board is analogous to estimating bus passengers carried by counting seats rather than heads. In short, an assumption
had been made that the number of berths on board a vessel was always an accurate estimate of those at risk.

A surrogate EPFR, obtained by summing the numbers of full time and part time fishermen registered in each fishery district as at 31 December each year, was used instead. These data were compared with the official EPFR for deep sea vessels: except for the years 1976 to 1980 inclusive the difference between each annual official EPFR and the surrogate EPFR never exceeded 2% of the former. The greatest difference, 23%, occurred in 1978. This surrogate provided a base for calculating mortality for both inshore and deep sea groups. The surrogate EPFR based on MAFF/DAFS data excluded so called "hobby fishermen" (those not fishing commercially) from 1966 onwards.

Annual crude mortality rates (expressed per 1000 fishermen at risk) were calculated for each year from 1961 to 1980 inclusive for deep sea and inshore fishermen separately and combined. Deep sea fishermen were defined as those working aboard vessels $\geq 24.4$ m (80 feet) whereas inshore fishermen were defined as those aboard vessels $< 24.4$ m. This definition is unsatisfactory in indicating the type of fishing or the geographical locus of activity, but, historically, mortality data have been collected using vessel length (previously tonnage) as the criterion.

Levels of statistical significance of the differences between means were determined using Student's $t$ tests. Correlations between vessel loss rates and death rates from accidents were calculated using Spearman's rank order correlation technique.

Mortality data for the UK coal mining industry were obtained directly from the Health and Safety Executive (Mines and Quarries Inspectorate) and these rates are expressed per 100 000 at risk.

**Results**

**TOTAL RECORDED DEATHS AT SEA BY CAUSE AND BY GROUP**

Between 1 January 1961 and 31 December 1980, there were 909 recorded deaths of fishermen at sea (fig 1). Of these, 711 deaths (78.2%) were due to accidents arising either from losses of and damage to fishing vessels (founderings or fires, for example) or from individual personal accidents (slips, falls, entanglement in unguarded machinery, and losses overboard). The remaining 198 deaths (21.8%) were non-accidental, arising predominantly from unspecified disease as well as several cases of homicide and suicide.

This grand total, excluding an unknown number of deaths occurring ashore due to occupationally related accidents or disease, represented a mean of 45 deaths a year or one fatality at sea every eight days throughout these 20 years. Deaths from accidents alone averaged 35 a year. With the prominent exceptions of 1968 (losses of St Romanus, Kingston Peridot, and Ross Cleveland) and 1974 (loss of Gaul28) the annual death rate fluctuated between 1.4 and 2.8/1000 at risk (fig 2). The mean crude mortality rate for deaths from all causes at sea was 2.16/1000 at risk (SEM = 0.178) for the entire period.

Table 1 shows cause specific deaths (and rates) by group. Fifty six per cent of deaths ($n = 511$) involved inshore fishermen compared with 44% ($n = 398$) for deep sea fishermen. On deep sea vessels the foremost immediate cause of death was due to the loss of the vessel ($n = 200$) followed by individual personal accidents ($n = 158$) whereas on inshore fishing vessels personal accidents ($n = 192$) outnumbered deaths from vessel losses ($n = 161$). Most of the deaths from unspecified disease occurred among inshore fishermen. Suicides and homicides featured more among deep sea than inshore deaths. With the exception of deaths from disease at sea, deep sea fishermen were consistently at greater risk of death from personal accidents, vessel losses, and homicide/suicide.

**DEATHS FROM ACCIDENTS AT SEA DUE TO VESSEL LOSS OR DAMAGE**

The 361 deaths due to vessel loss or damage were assigned to one of seven mutually exclusive causes of loss contributing to death (table 2). The predominant known cause of loss contributing to death was...
Table 1  Deaths and rates (per 1000 at risk) by cause and group 1961-80

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Accidental Vessel losses</th>
<th>Accidental Personal accidents</th>
<th>Non-accidental Disease</th>
<th>Homicide/ suicide</th>
<th>All Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep sea fishermen</td>
<td>No 200 (1-54) 158 (1-22) 15 (0-12) 25 (0-18)</td>
<td></td>
<td></td>
<td></td>
<td>398 (3-06)</td>
</tr>
<tr>
<td>Rate 161 (0-56) 192 (0-70) 155 (0-55) 3 (0-01)</td>
<td></td>
<td></td>
<td>1 (1-81)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inshore fishermen</td>
<td>No 361 (0-86) 350 (0-83) 170 (0-39) 28 (0-09)</td>
<td></td>
<td></td>
<td></td>
<td>909 (2-16)</td>
</tr>
<tr>
<td>All</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>361 (0-86) 350 (0-83) 170 (0-39) 28 (0-09)</td>
<td></td>
<td></td>
<td></td>
<td>909 (2-16)</td>
</tr>
<tr>
<td>Rate</td>
<td>100-00</td>
<td></td>
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<td></td>
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</tbody>
</table>

Table 2  Accidental deaths arising from vessel losses

<table>
<thead>
<tr>
<th>Cause of loss contributing to death</th>
<th>No</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foundering</td>
<td>96</td>
<td>26-59</td>
</tr>
<tr>
<td>Fire/explosion</td>
<td>52</td>
<td>14-41</td>
</tr>
<tr>
<td>Stranding</td>
<td>24</td>
<td>6-65</td>
</tr>
<tr>
<td>Collision</td>
<td>20</td>
<td>5-54</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
<td>1-11</td>
</tr>
<tr>
<td>Missing</td>
<td>165</td>
<td>45-70</td>
</tr>
<tr>
<td>Capsize</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All causes</td>
<td>361</td>
<td>100-00</td>
</tr>
</tbody>
</table>

founderings (26-59%) followed by fires and explosions (14-41%), strandings (6-65%), collisions (5-54%), and other unspecified causes of loss (1-11%). No deaths were ascribed to capsizings. One hundred and sixty five deaths (45-7%) occurred on “missing” vessels for which the cause of loss remained unknown.

Table 3  Accident death rates (per 1000 at risk) from vessel losses by cause and group

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>Rate</td>
<td>No</td>
<td>Rate</td>
<td>No</td>
<td>Rate</td>
<td>No</td>
</tr>
<tr>
<td>Foundering</td>
<td>43 (0-55)</td>
<td>18 (0-46)</td>
<td>10 (0-08)</td>
<td>25 (0-16)</td>
<td>53 (0-26)</td>
<td>43 (0-21)</td>
</tr>
<tr>
<td>Fire/explosion</td>
<td>17 (0-18)</td>
<td>23 (0-43)</td>
<td>4 (0-03)</td>
<td>8 (0-06)</td>
<td>21 (0-09)</td>
<td>31 (0-15)</td>
</tr>
<tr>
<td>Stranding</td>
<td>9 (0-09)</td>
<td></td>
<td>8 (0-07)</td>
<td>7 (0-04)</td>
<td>17 (0-09)</td>
<td>7 (0-03)</td>
</tr>
<tr>
<td>Collision</td>
<td></td>
<td>3 (0-05)</td>
<td>9 (0-06)</td>
<td>8 (0-04)</td>
<td>12 (0-05)</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>3 (0-03)</td>
<td>1 (0-01)</td>
<td>3 (0-01)</td>
<td>1 (0-01)</td>
<td></td>
</tr>
<tr>
<td>Missing</td>
<td>42 (0-51)</td>
<td>45 (0-81)</td>
<td>25 (0-15)</td>
<td>53 (0-34)</td>
<td>67 (0-29)</td>
<td>98 (0-48)</td>
</tr>
<tr>
<td>All causes</td>
<td>111 (1-33)</td>
<td>89 (1-75)</td>
<td>58 (0-44)</td>
<td>103 (0-67)</td>
<td>169 (0-78)</td>
<td>192 (0-93)</td>
</tr>
</tbody>
</table>

Table 3 shows accident death rates from vessel losses by cause and by group and table 4 the percentage change between pre-CITS and post-CITS death rates. Apart from deaths on missing vessels the highest rates associated with vessel losses are those from founderings (on deep sea and inshore vessels) and fires (on deep sea vessels). The greatest post-CITS increases were 139% for deaths from fires on deep sea vessels and 100% for deaths from founderings on inshore vessels.

DEATHS FROM ACCIDENTS AT SEA DUE TO PERSONAL ACCIDENT

Although 350 deaths were recorded as personal accidents, the place of death (on the vessel) was known only for the 158 deaths aboard deep sea vessels (table 5). Details of 192 deaths from personal accidents on board inshore vessels were not recorded.

One hundred and twenty deep sea deaths (75-9%)
were due to losses overboard and 35 (22.2%) were caused by accidents on deck such as slips, falls, and plunges into uncovered hatchways. Deaths in the engine room were uncommon. The mortality rate for losses overboard from deep sea vessels increased by 46.7% from 0.75 deaths per 1000 at risk (1961–70) to 1.10 deaths per 1000 at risk (1971–80). Fatal accidents on deck also increased by 66.7% from 0.21 to 0.35 deaths per 1000 at risk between the same decades.

Deaths at Sea Due to Disease, Homicide, and Suicide
A total of 198 deaths (158 inshore and 40 deep sea) were notified. No cause of death from disease was recorded nor was any ICD (International Classification of Diseases) classification provided. This contrasts noticeably with the detailed manner in which deaths from undisclosed disease aboard merchant vessels are classified.

Twenty eight deaths from homicide and suicide included 25 deep sea fishermen (23 suicides, 2 homicides) and three inshore fishermen (2 suicides, 1 homicide). Suicides outnumbered homicides by 8:3:1.

Trends in Mortality from Accidents
Accident death rates for 1961–80 are shown in fig 3(a) for deep sea fishermen, in fig 3(b) for inshore fishermen, and in fig 3(c) for both groups of fishermen. For deep sea fishermen, the mean death rate from accidents at sea increased by 38.96% from 2.31/1000 (1961–70) to 3.21/1000 at risk (1971–80). The magnitude of this increase reflected concomitant increases not only in deaths due to vessel losses (+31.58%) but also in personal accidents (+48.98%, p < 0.05).

By contrast, the mean death rate from accidents for inshore fishermen decreased by 3.91% from 1.28/1000 (1961–70) to 1.23/1000 at risk (1971–80) although the underlying trend for both decades was upwards. The apparent stability of the rate for inshore fishermen
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Table 6  Accident death rates (per 1000 at risk) by cause and by group

<table>
<thead>
<tr>
<th>Cause of death</th>
<th>Vessel losses</th>
<th>Personal accidents</th>
<th>All causes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deep sea fishermen</td>
<td>1.33</td>
<td>1.75</td>
<td>0.98 *</td>
</tr>
<tr>
<td></td>
<td>2.31</td>
<td>3.21</td>
<td>1.28 **</td>
</tr>
<tr>
<td>Inshore fishermen</td>
<td>0.44</td>
<td>0.67</td>
<td>0.84 *</td>
</tr>
<tr>
<td></td>
<td>1.67</td>
<td>1.70</td>
<td>0.89</td>
</tr>
</tbody>
</table>

*Statistically significant difference between decades for deep sea (p < 0.05) and inshore (p < 0.01) fishermen.
**Statistically significant difference between groups for personal accidents (p < 0.001) and all causes (p < 0.05).

over the 20 year period masked two diametrically opposite changes: on the one hand, deaths from personal accidents appeared to decrease by 33.3% (p < 0.01) whereas, on the other, deaths associated with vessel losses increased by 52.27% from 0.44/1000 (1961–70) to 0.67/1000 (1971–80). This latter observation accords with the finding of an increased TL/SC rate, particularly for inshore vessels. The lowest death rate (0.6/1000) was recorded in 1973 and the highest (2.3/1000) as recently as 1979.

The death rate from accidents at sea for all fishermen (fig 3(c)) depicts an increase of 1.80% from 1.67/1000 (1961–70) to 1.70/1000 men at risk (1971–80). The underlying trend for both decades was upwards. Table 6 shows the time-specific mean death rates from accidents. Statistically significant differences between these rates are also indicated.

Investigation of the relationship between vessel loss/casualty rates (by group) and death rates from accidents (by cause) showed a statistically significant positive correlation (r = +0.628; p < 0.05) for the deep sea group but a non-significant, weakly negative value (r = -0.043) for the inshore group.

INTEROCUPATIONAL COMPARISON

Figure 4 shows the comparison of the annual accident death rate for the fishing and coal mining industries. Not only is the mortality experience of fishermen raised in relation to coal miners but whereas there has been a gradual and sustained reduction in the mortality rate for coal miners no such improvement has occurred in the fishing industry.

Discussion

Previous studies have examined fatal accident rates within the industry; discussed disease to which fishermen are particularly prone, and highlighted the dangers, consequences, and prevention of hypothermia. No attempt has been made to monitor medium or long term trends in accident death rates for all fishermen, however, nor has any effort been expended in providing data for inshore fishermen comparable with that routinely available for deep sea fishermen.

SOURCES OF ERROR

Deaths of fishermen occurring at sea, or in the sea, are normally recorded by the Registrar General of Shipping and Seamen (RGSS) whereas deaths of fishermen occurring ashore (including those from accidents arising at sea) or in air transit (in a helicopter) are recorded by the General Register Office (GRO) in the same way as for other members of the general population (fig 5). It was this duality of recording practice that, hitherto, led to an underestimation of the mortality of fishermen from all causes because deaths at work, recorded by the RGSS, had simply been excluded from previous calculations. The RGSS records deaths that have been the subject of a death inquiry within the context of section 386 of the Merchant Shipping Act 1894 (for deaths before 1970) or section 61 of the 1970 Act (from then onwards). Deaths registered by a coroner (England and Wales), a procurator fiscal (Scotland), or in the "normal" way
Fig 5  Registration of deaths of United Kingdom fishermen.

are therefore excluded. If for whatever reason a coroner or procurator fiscal considers a death to be outside his jurisdiction and declines to investigate or register, then the RGSS is obliged to assume responsibility for registration.

Deaths that occur ashore or in emergency air transit, as a consequence of accidents sustained at sea, are usually recorded not by the RGSS but by the appropriate mainland GRO. Because long range maritime rescue facilities are now more widely available and medical evacuations are effected with increased frequency and apparent ease, recent deaths ashore arising from accidents at sea, and similar to those previously recorded by the RGSS, might have been excluded or reduced as these more efficient rescue techniques have been introduced. These possible sources of registration error, assuming a constant denominator, underestimate actual mortality from accidents at sea rather than the reverse.

MORTALITY OF DEEP SEA FISHERMEN FROM ACCIDENTS

After the Icelandic fishing dispute in the early 1970s, the composition of the fishing fleet and workforce altered radically. In 1961 the ratio of deep sea to inshore fishermen was 1:1.5, in 1970, 1:1.7, and by 1980 it was 1:7.0. Since CITS reported, there has been an increase in the accident death rate: this arises from increases in deaths from vessel losses as well as from individual personal accidents. The reasons for these increases are not directly attributable to any single cause but rather to a combination of causes of which the following are the most readily identified.

Vessel losses

The post-CITS increase (+31.6%) in the mean death rate was due primarily to:

Loss of the Gaul—Some of this increase arises from the single loss of the Gaul in 1974 with a crew of 36. The cause of this loss was probably due to the effects of severe weather conditions combined with other unknown circumstances such as flooding. The Gaul appears not to have been lost as a consequence of inadequate intact stability or poor seakeeping qualities.

Fires and explosions—Apart from deaths due to foundering and missing vessels, the leading causes of post-CITS deaths were fires and explosions. Whereas the statutory requirements since 1975 for structural fire protection, detection, and fire appliances appear to be comprehensive, this observation is belied by the finding that about half of all fishermen had not received any training in survival or firefighting. An added dimension to the problem of tackling fire on board fishing vessels was illustrated recently off the west coast of Scotland when a request was made for the help of mainland firemen. Regulations and insurance complexities prevented expert firefighters from helping or providing essential equipment—particularly breathing apparatus—which was not available to the fishermen.

Personal accidents

The post-CITS increase (+49.0%; p < 0.05) in the mean death rate was due primarily to:

Losses overboard—The data available provide no explanation of increased losses overboard and there is no obvious hypothesis. The 1975 rules demand minimum heights (determined by the magnitude of the vessel numeral*) for efficient bulwarks, guard rails, or guard wires. The effectiveness of these minima in preventing losses overboard has never been assessed. The idea of "tethering" fishermen, akin to the methods used by yachtsmen or RNLI crews, deserves greater application, even allowing for the practical difficulties that might be encountered on a working deck. The preservation of life, once overboard, depends on reducing the likelihood of hypothermia and subsequent loss of consciousness. The need for protective clothing, its preferred design, and evaluation tests have already been discussed. Given the latitudinal range within which United Kingdom deep sea vessels operate, a casually clothed or unprotected body becomes hypothermic at the earliest within several minutes and at the latest within 90–120 minutes. If rescue time is likely to exceed normal survival time, and sometimes it will, extra clothing (preferably a survival suit) is vital. Even if a man overboard is noticed immediately and rescue (by on board means) is initiated promptly, the time and sheer effort required to haul a body from the water up and on to the deck of a fishing vessel may be considerable. If the leading United Kingdom oil companies demand compulsory wearing of survival clothing on all over water flights and insist on mandatory survival training for all offshore personnel, there can be few rational objec-

*"Vessel numeral" means the product obtained by multiplying together the principal length by the principal breadth by the principal depth of the vessel.
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Mortality from causes other than accidents

Although deaths from disease, homicide, and suicide accounted for a substantial proportion (21.78%) of all deaths at sea, currently available data do not merit further discussion.

By contrast with practice elsewhere, nearly all United Kingdom fishermen are eligible for employment without medical examination and may put to sea without restriction with undisclosed but often detectable disease and often with medical conditions that would prevent employment in less stressful and much less hazardous work environments. In 1974 the Commission of the European Communities produced criteria for assessing medical suitability for work on fishing vessels. To date these guidelines, or variants, have not been implemented in the United Kingdom, nor has the Department of Transport published any proposals for their introduction. Fifteen years after CITS recommended that “medical services should be extended to all ports and increased in scope,” provisions for medical care actually appear to have been reduced since then and the spirit of that recommendation has been ignored. In the light of current evidence, and given practice abroad, there can be no justification for the further contraction of an already limited medical service.

Any future strategy intended to prevent or minimise the occupational mortality of fishermen from accidental and non-accidental causes must, at the very least, incorporate proposals for an effective injury control programme and for adequate recording and unrestricted publication of more detailed fatal and non-fatal accident statistics. With effect from 1 October 1985 the Department of Transport finally introduced regulations stipulating compulsory reporting of every accident resulting in death or personal injury involving incapacity for more than three consecutive days. A comprehensive medical examination on entry to the industry with subsequent examinations as often thereafter as considered necessary by the appointed medical examiner should be compulsory too.

Whatever expectations were entertained in the wake of the CITS report, the evidence confirms that deep sea fishermen were at no lesser risk of death from accidents after CITS reported than before. Overall, both groups of fishermen experienced an accident mortality rate between 1961 and 1980 that showed no indication of improvement. The challenge that this finding presents has yet to be acknowledged and tackled by government and industry alike.

I acknowledge the help and cooperation of Mr K Foley (MAFF); Mr A Reid (DAFS); and Mr S Lendesborough (DTp-Marine Directorate). I am grateful to Mr S Ogston who offered statistical advice.
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