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Global estimates of fatal occupational accidents

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GLOBAL ESTIMATES OF FATAL OCCUPATIONAL ACCIDENTS

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Abstract

Objective: Data on occupational accidents is not available from all countries in the world. Furthermore, under-reporting, limited coverage by reporting and compensation schemes, and non-harmonized accident recording and notification systems undermine efforts to obtain world-wide information on occupational accidents. This paper presents a method and new estimated global figures of fatal accidents at work by region.

Method: The fatal occupational accident rates reported to the International Labour Office are extended to the total employed manpower in countries and regions. For areas not covered by the reported information rates from other countries that have similar or comparable conditions are applied.

Results: An average estimated fatal occupational accident rate in the whole world was 14.0/100,000 workers and the total estimated number of fatal occupational accidents was 335,000 in 1994. The rates are different for individual countries and regions and for separate branches of economic activity.

Conclusions: Fatal occupational accident figures are higher than previously estimated. The new estimates can be gradually improved by obtaining and adding data from countries where information is not yet available. Sectoral estimates for at least key economic branches in individual countries would further increase the accuracy.

Keywords: Occupational accidents, fatality rates, statistics, recording and notification systems.

Background

The International Labour Office (ILO) collects and publishes global accident figures and rates which are based on national recording and notification systems¹. The ILO also supports member States to enhance their recording and notification systems for occupational accidents and diseases². However, reasonably reliable data may only be obtained from a rather limited number of countries i.e. from about one third of the ILO's 174 member States. The information is not based on harmonised recording and notification systems, under-reporting is common, and in many countries the reporting and compensation systems cover only selected economic activities leaving out major sectors, such as agriculture, that are known to have higher than average accident frequency rates. Furthermore, some countries cover commuting accidents, traffic accidents at work, and occupational diseases while others do not. Fatal occupational accidents are better reported than non-fatal in developing countries but same limitations apply¹. Under-reported figures and low estimates are currently used as a baseline for priority setting at the national level which leads to preventive action that is less than appropriate.

In addition to a better picture on fatal accidents, rough estimates of non-fatal accidents could be derived from the data on fatal accidents.

Studies in USA³, Australia⁴, Zimbabwe⁵, Finland⁶ and the European Union^{7,8} show that - if reporting is reliable enough - a rather constant ratio exists between fatal and non-fatal accidents that lead to absence from work. This was shown first time by the classical work of Heinrich⁹ already in 1931.

Earlier estimates have been based on a crude global fatality rate (8/100,000 workers) obtained from existing sources of industrialised countries. No attempts have been made to estimate such rates regionally. These earlier figures have been shown to be underestimates by new information from developing countries. New sources are based on real counts of fatalities in selected ILO member States and range from 1.5 to 5 times higher¹ than the old estimates.

Objective

The objective of this paper is to establish a better method to estimate the number of fatal occupational accidents, in particular, at global but also at regional and national levels. This estimate can be based on available data, and it would provide a basis for setting policies and priorities for prevention of such accidents, as well as for funding and national decision making. More realistic estimates would demonstrate a visible difference compared to the actual - and often unrealistic - reported data, which in turn would motivate countries to improve their recording systems. The need for international harmonization of reporting methods and criteria will be easier understood.

What is reported – source data

Usually the ILO's member States report both absolute numbers and frequency rates of fatal occupational accidents calculated for 1,000 workers. The frequency rates are more useful than absolute numbers for preventive purposes and for comparisons within and outside the reporting field. The ILO receives reports that usually contain information on fatal accidents at work and include those accidents that occur in traffic while the worker is carrying out his duties. Fatal commuting accidents and fatal occupational diseases are often but not always separately reported although the latter figures are very poorly given. The reliability, comparability and transparency of data are reduced, if these figures are not given separately. The data has been obtained from the annual compilation of the ILO *Yearbook of Labour Statistics*¹.

Detailed accident statistics are equally submitted to the ILO and these are included in the CISDOC database¹⁰. This database was used for the study to retrieve country specific published data.

Employment figures have been obtained from the ILO *Yearbook*¹, the United Nations Development Programme *Human Development Report 1994*¹¹ and from the *Global Burden of Disease and Injury Series* of Murray and Lopez¹². If either employment or fatality rate was not available for the year in question data from the closest year where data was available was used.

Method

Accident reporting schemes of industrialized countries and of economies in transition cover higher proportion of the employed manpower than those of developing countries, but even in industrialized countries normally not all industries, such as agriculture and the self-employed, are included. Information from developing countries is often limited to a small proportion of the economically active manpower. When reported rates, in fatal accidents per 100,000 workers, are applied to the whole economically active manpower much higher - and more reliable - numbers of fatal occupational accidents are obtained. To estimate the rates for countries where no reliable data is available rates from similar or comparable countries have been used.

Example: The given occupational fatality rate for Finland was 3.2/100,000 in 1993⁶. The equivalent covered population was 1.729 million employees (reporting base). The number of occupational fatalities within this group was 56. The size of the employed labour force, active employment, was however 2.064 million, which includes the self-employed, in particular, farmers, not included in the usual reporting scheme. When the rate 3.2 is applied to all employed, a calculated but realistic figure 66 is obtained. Some ten (10) fatalities were discovered that were not reported to the ILO. This figure (10) was then compared to the separately reported number of occupational fatal accidents for the 131,000 insured farmers, which was 6. The remaining number of expected but not reported fatal accidents (4) for the 104,000 actively employed (=self-employed) workers, which were not covered by the reporting scheme, looks very reasonable (3.8/100,000 workers while the overall rate was 3.2/100,000). This method thus produced almost precisely accurate results for the fatal accidents of self-employed workers, which are normally not reported to the ILO. In addition, the detailed statistics also reported 14 commuting fatalities and 92 fatal occupational diseases, of which almost all caused by asbestos.

The method is not expected to be equally accurate for countries where the missing part of information is proportionally much higher.

Results

The results have been classified according to the World Bank regions since regional employment figures were available and comparable countries are reasonably well grouped together. Table 1 covers the Established Market Economies (EME's) and provides well reported data. The total number of fatal occupational accidents was estimated (calculated) to be 19,662 while the reported number was 16,320. For some countries specifically reported data was used to cover missing information. For example the fatality rates for Norway are average rates from 1985-1989¹³.

The European Union rate (5.89/100,000 workers) was calculated for 1994⁷ based on 13 countries following the model of Eurostat. Data from the Netherlands and the United Kingdom were not used. The resulting rate (5.89/100,000 workers) was slightly lower than the latest available given rate from the EU for the previous year 1993 (6.10/100,000 workers). It may reflect either random fluctuation of the number of accidents from year to year or a real decline and improvement in work environment in the European Union. However, even the fairly well organised reporting systems in Europe miss some 3,000 occupational fatalities: 9,027 expected, 5,977 reported.

For some countries, such as Japan, the fatality rate was not reported from the original source but calculated by the author. This provides another source of error as the given number of fatalities may well be obtained from a smaller population than the full active employment. Such errors are producing more conservative results and can be corrected once information becomes available.

Major disasters can also be detected, such as the Baltic ferry disaster, which doubles the Swedish figures for the year 1994 from the usual. Similar expected increase is not visible in the Estonian figures, which may be caused by different compensation practices.

Reported figures and corresponding frequency rates are never overestimated as they are based on facts. However, the mixing of commuting accidents (and rarely diseases) may cause a source of erroneous increase. This is likely to be offset by the more frequent sources of erroneous decrease.

Table 2 on Former Socialist Europe (FSE) is already somewhat less reliable since the number of missing data is higher. Therefore, no meaningful resulting number of reported data to the ILO for the whole region can be given. The expected number of fatal occupational accidents (15,563) is, however, realistic.

Figures on both India and China (Table 3), are much less reliable and based on figures from other countries and regions: Malaysia (11.0/100,000) in the case of India and FSE (11.1/100,000) in the case of China. It is likely that the real figures are (considerably) higher than estimated and expected to increase closer to the levels of countries in the group Other Asia and Islands (OAI) as the Indian and Chinese economies continue to grow.

The highest rates (23.1/100,000) and absolute fatality figures (80,586) are found in Other Asia and Islands (OAI) as shown in Table 4. The reason is that the rapidly industrialising countries such as the Republic of Korea, Thailand and Indonesia have reported high fatal accident frequency rates. These rates are, however, obtained from a relatively small part of the manpower, which is covered by the compensation schemes. The biggest component of the usually non-covered manpower is the agriculture, which is clearly more dangerous than the average of all industries in the whole world. The given fatality rate in the Republic of Korea in agriculture (90/100,000) is close to three times more dangerous than the average fatality rate (34/100,000). Methods in agriculture may, however, differ and the average rate in agriculture may be not so high in all other countries of the region.

The component of Table 5 that covers Sub Saharan Africa is almost solely based on the frequency rate in Zimbabwe. Togo figures are close to those in Zimbabwe. The resulting absolute number of fatalities is not much more than an informed guess before further information becomes available. Farmers' fatality rates are, however, providing some indicators as most of the actively employed in the region are occupied in agriculture. Burkina Faso had an agricultural fatality rate of 99.7/100,000. Guinea-Bissau had a 6-year average agricultural fatality rate of 90/100,000 but obviously based on a very small population covered.

Latin-American results are based on the biggest country figures i.e. those of Brazil. Other available data (Bolivia, Colombia, Mexico, Panama, Guatemala) confirm that the rate for the region (13.5/100,000) is reasonable.

Middle Eastern Crescent (MEC) has been based on a weighted average of Turkey and Egypt, which are reasonably large samples of the region. The rate in agricultural work is again higher than average. The last part of table 5 shows an overall absolute figure of fatalities in the region to be 41,850.

World figures are summed up in Table 6. The world rate is 14.0/100,000 workers and the estimated absolute number of fatal occupational accidents comes close to 335,000. The earlier ILO estimate has been 220,000 fatalities, which is clearly shown to be an underestimate¹⁴.

Discussion

How to improve the accuracy of the figures obtained?

The estimated or obtained industry (economic branch) specific frequency rates and corresponding employment figures from regions or countries that have similar or comparable conditions would provide a more accurate basis for calculations. If, for example, rates for agriculture, construction, transport and informal sector could be obtained from representative countries or regions, and if these sectoral rates would be weighted with the actual numbers of sectorally employed workers, the country estimates would be much better.

How to get figures of non-fatal accidents?

The ratio between fatal occupational accidents and accidents causing three or more days' absence from work varies with a wide range:

1/10	Africa ¹
1/600	ILO earlier estimate ¹⁵
1/933	USA ratio of fatal per all disabling accidents in 1992 (6,529/6.09 million) ³
1/1019	Finland: 55/56,072 3 days or more absence from work in 1994; 1/975 in 1993 (56/54,623)
1/1818	55/99,980 for all notified accidents in Finland
1/2029	USA ratio of fatal per all non-fatal injuries in 1992 (6,529/13.247 million)

A low ratio indicates under-reporting of minor accidents, which is very common. No cases of over reporting are expected. A reasonably conservative ratio 1/750, between the fatal accidents and non-fatal accidents could be a basis for a new ILO estimate of non-fatal occupational accidents. This would elevate the ILO's estimate of the number of accidents to **250 million** per year in the whole world, if the estimates are derived from the figures presented above. Using a higher ratio experienced in Finland and USA (1/1000) would result in a world figure of 335 million. In fact, the recently presented ILO, WHO and United Nations figures, 250 million occupational accidents and 160 million occupational diseases are still based on relatively conservative estimates¹⁶.

How to get all work-related fatalities?

Commuting accidents are generally not included in the results given above. The ratio between occupational accidents (at the workplace and in traffic at work) and commuting accidents is 68%/32%¹⁷ (or more precisely fatal accidents at work/ fatal traffic accidents at work/ fatal commuting accidents: 49.3%/18.6 %/32%). If the estimate for the world, 335,000 fatal occupational injuries caused by accidents, is taken as a baseline, the estimate for fatal commuting accidents will be 158,000.

The ratio of work-related traffic fatalities from all traffic deaths is 7.67%¹⁷ (traffic at work/ commuting: 2.77%/4.89% of all traffic fatalities). In the USA the ratio of fatal highway work accidents is 3.04 from all fatal road accidents¹⁸ i.e. slightly higher than that in Finland. The ratio of fatal commuting accidents (of all fatal traffic accidents) in USA is most likely also higher, and probably clearly higher for developing countries, where proportionally less time is consumed in leisure time traffic (fewer motor vehicles).

Example: Murray and Lopez¹⁹ estimate that there are 222,000 road traffic accidents in the developed regions. Of those some 7.67% or 17,027 fatal road accidents are work-related (at work in traffic or commuting accidents). Roughly the same number, or 17,000 (49.3% of total work-related fatal accidents) is expected to take place at a stationary workplace, and 6324 while in traffic at work, total at work some 23,000. The calculated figure for EME countries was 19,662 such fatalities in 1994.

The ratio of fatal occupational accidents/fatal occupational diseases was 51%/49% calculated from all fatal occupational injuries in Finland in 1990 - 1994, and 40%/ 60% in 1994¹⁷.

This would mean 325,000 fatal occupational diseases in the whole world. Counting all these together:

335,000	fatalities at workplace
158,000	fatalities for commuting between work and home
325,000	fatal occupational diseases

818,000 Total

However, this does not cover such diseases that are only partially work related, such as diseases of the heart and the circulatory system. S. Hansen's (Denmark) estimate in the *Working conditions and environment in figures*²⁰ is that 10% of such diseases are work related. There are some 6.26 million deaths caused by ischaemic heart disease in the world, which would mean, if Hansen's estimate is used, 626,000 additional work related deaths. Furthermore, the reference values in Finland cover no silicosis as it is rarely found and practically no fatalities

occur any more. Thus, the number of fatal occupational diseases is expected to be an under-estimate.

The Australian National Occupational Health and Safety Commission estimates that there are 2,900 work related fatalities in Australia⁴. The total employment in Australia was 8.235 million in 1995. The frequency rate for fatal work related injuries (work related accidents and diseases) is 35.2/100,000 workers. The extrapolated world number of work related fatalities is 843,299.

Murray and Lopez estimate that there were 1,129,000 to work-related fatalities 1990. Taking into account the missing work related diseases in the calculations above the magnitudes of the three methods seem to match well. This number - **1.1 million** -, could be considered as the best available estimate of annual work related deaths in the world. This means 3000 deaths caused by work every day.

Table 7 presents the categories of work-related injuries and the estimates of fatal injuries in each category.

Information which will be annually accumulated and added to the ILO's databases will certainly increase the accuracy of these estimates, however, radical changes are not expected. Probably a small gradual growth can be expected due to better reporting and increasing world population and active labour force.

Critical comments

Although the numbers above are based on practically all available information precautions in the interpretation are necessary:

1. Conditions are never completely comparable from one country to other, industrial structures influence strongly the rates of accidents. This results in inaccuracies if rates of one country or region are used - in the absence of proper data - to estimate numbers in another area. For example, if mining and construction industries in one country employ relatively more workers than in another country or region, figures and rates are poorly transferable.
2. Employment figures used were often inaccurate.
3. Under-reporting is likely even in the most advanced countries.
4. Only limited information is available for the two most important sectors in developing countries: the agricultural and informal sectors. These cover more than 50 % of the world active employment. Further specifically planned studies should be undertaken to reveal more accurate information.
5. The number of unemployed was estimated but that of the underemployed has not been taken into account. It is likely that a major part of the underemployed are engaged in the informal sector but details are not available.

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References

- ¹ International Labour Office: *Yearbook of Labour Statistics* 1996, 55th issue, Geneva 1996. 1145p. (in English, French, Spanish)
- ² International Labour Office: *Recording and Notification of Occupational Accidents and Diseases*, Code of Practice, Geneva 1996, 97p.
- ³ Leigh J.P., Markowitz S.B., Fahs M., Shin C., Landrigan P.: *Occupational Injury and Illness in the United States*. Arch Intern Med. 1997; Vol.157: 1557-1568
- ⁴ National Occupational Safety and Health Commission: *Australian Occupational Health and Safety*, Statistics Bulletin No.1 - Trends Over Recent Years. Sydney 1997.
- ⁵ Loewenson R.: *Health Impact of Occupational Risks in the Informal Sector in Zimbabwe*. An ILO report issued in Internet: <http://www.ilo.org/public/english/90travail/sechyg/papers/infzimb/index.htm>
- ⁶ Statistics Finland, Ministry of Labour: *Accidents at work 1993*, Official Statistics of Finland, Helsinki 1996. 70p. (in Finnish, Swedish and partially English)
- ⁷ Eurostat: *Statistic in Focus 1997/2, Accidents at work in the European Union in 1993*, Initial Results. European Commission, Luxembourg 1997. 4p.
- ⁸ Eurostat: *Statistics in Focus, 1998/2, Accidents at work in the European Union in 1994*, European Commission, Luxembourg, 1998, 4p.
- ⁹ Heinrich H.W.: *Industrial Accident prevention*. First ed., 1931, copyright 1969 by Vida E. Heinrich, McGraw-Hill Co., USA
- ¹⁰ International Occupational Safety and Health Information Centre, CIS: CISDOC bibliographic database, printed, on-line and CD-ROM versions, ILO Geneva 1997 (in English and French)
- ¹¹ United Nations Development Programme: *Human Development Report 1994*, New York 1994. 226p.
- ¹² Murray C.J.L., Lopez A.D., Vol. II of the *Global Burden of Disease and Injury Series, Global Health Statistics*, World Health Organization, World Bank, Harvard School of Public Health, Harvard, Cambridge, MA, 1996.
- ¹³ The Danish Work Environment Service: *Fatal Accidents at Work, Fatal Accidents in the Nordic countries over a ten-year period*, Copenhagen 1993. 28p.
- ¹⁴ International Labour Office/World Health Organization: *Methods for health impact assessment in environmental and occupational health*. Report on WHO/ILO Consultation, ILO/WHO Geneva, 1998. p.19-20.
- ¹⁵ International Labour Office: *Programme and Budget for 1998-99*, ILO, Geneva 1997.
- ¹⁶ Annan K.A.: *Occupational health and safety: A high priority on the global, international and national agenda*. Editorial, Afr. Newslett. on Occ. Health and Safety, Vol.7, no 3, 1997, p.51, Asian-Pacific Newsletter on Occupational Health and Safety, Vol.4, n°3, 1997, p.59, ILO and Institute of Occupational Health, Helsinki.
- ¹⁷ Statistics Finland, Ministry of Labour; *Accidents at work 1994*, Official Statistics of Finland, Helsinki 1997. 70p. (in Finnish, Swedish and partially English)
- ¹⁸ National Safety Council: *Accident Facts 1996 Edition*. Itasca Ill., 1996, 154p.
- ¹⁹ Murray C.J.L., Lopez A. D.: *Summary, the Global Burden of Disease*, World Health Organization, World Bank, Harvard School of Public Health, Harvard, Cambridge, MA, 1996. p.18
- ²⁰ Ministry of Social Affairs and Health: *Working conditions and environment in figures*. Tampere, Finland 1997. 82p. (in Finnish)

FATAL OCCUPATIONAL ACCIDENTS INCLUDING TRAFFIC ACCIDENTS AT WORK

TABLE 1

ESTABLISHED MARKET ECONOMIES (EME)					
Country	Reported Fatality Rate F, ¹⁰ ⁵	Employment E, million	Fatalities F, x E	Fatal accidents reported to ILO	Notes
Australia	7.00	7.921	554	324	1994 ¹
Canada	6.93	13.506	936	724	1994 ¹
Iceland	2.20 c	0.137	3	3	1995 ¹
Japan	3.74 c	64.570	2,414	2,414	1994
New Zealand	5.30 (1993)	1.560	83	71	1995 ³
Norway	3.80 (1985-89)	2.079	79	60	1995 ¹
Switzerland	7.30	3.776	276	238	1994 ^d
USA	5.30 c	124.900	6,600	6,588	1995 NSC ^b
Austria	6.10	3.742	228	160	1994
Belgium	7.00 (1991)	3.772 (1992)	264	115	1994
Denmark	2.90	2.555	74	75	1994
Finland	3.20	2.064	66	56	1993
France	7.40	22.110	1,636	1,082	1991
Germany	4.70 c	36.076	1,712	1,712	1994
Greece	4.40	3.790	166	56	1994 ⁴
Ireland	3.60	1.268	46	50	1994
Italy	4.50	20.002	900	649	1994 ⁴
Luxembourg	10.00 c	0.190 (1990)	19	19	1992
Netherlands	3.10 c	6.692	213	213	.. ⁵
Portugal	5.80 c	4.458	258	258	1994 ⁶
Spain	10.20	12.042 (1995)	1,228	1,008	1994
Sweden	6.20	3.928	243	234	1994 ²
United Kingdom	1.40	25.317 (1993)	354	291	1994 ⁷
EU author calculation	5.89 ⁸ c	147.988	8,716 c	5,907	1994
EU given rate ^a	6.10 (1993 EU)	147.988	9,027 c	5,977	1993
Total EME author calculated	5.37	366.455	19,662	16,320	1994

a = Eurostat 1997-2
b = National Safety Council
c = calculated, not reported
d = Suva, Luzern
italics = data not available

1 = including diseases
2 = major shipping disaster
3 = commuting accidents and diseases included
4 = commuting reduced

5 = based on Belgian figures
6 = including commuting but without Public Administration Sector
7 = work traffic accidents added

TABLE 2

FORMER SOCIALIST EUROPE (FSE)					
Country	Reported Fatality Rate F_r	Employment E, million	Fatalities $F_r \times E$	Fatal Accidents reported to ILO	Notes
<i>Albania</i>	11.43	0.851 1991	97		
Belarus	8.90	4.696	417	400	1994
Bosnia & Herzegovina				27	1991
<i>Bulgaria</i>	11.43	2.032	232	2	1994
<i>Croatia</i>	11.43	1.108 1993	127	73	1993 ¹
Czech Republic	4.32	5.945	257	257	1994
Estonia	11.60	0.649	75	61	1994 ²
Hungary	11.40	3.751	427	151	1994
Latvia	7.40	1.205	89	89	1995
Lithuania	6.00	1.675	101	128	1995
Macedonia	6.00	0.396	45		
<i>Moldova</i>	11.43	1.681	192	66	1995
Poland	5.70	14.747	840	645	1994 ¹
Romania	7.00	10.914	763	482	1994
Russian Federation	13.80 1995	68.484	9,450	6,770	1994
Slovakia	6.00	2.147	129	121	1994
Slovenia	3.20	0.882	28	25	1994
Ukraine	12.00	19.119	2,294	2,300	1994
Yugoslavia (Serbia)		?			
FSE (10 countries)	11.43	127.060	14,524		
FSE	11.10	140.282 ³	15,563		1994

1 = including commuting
 2 = including commuting & diseases
 3 = source: World Bank

italics = data not available, calculated based on average of other countries in the region

TABLE 3

INDIA (IND)					
Country	Reported Fatality Rate F_r	Employment E, million	Fatalities $F_r \times E$	Fatal Accidents reported to ILO	Notes
<i>India</i>	11.0	334.000	36,740	310	Human Development Report 1994, Labour Force, Employment; F_r based on Malaysia total: 11.0;

italics = data not available, rate based on estimate and Malaysian average 11.0; Indonesia total 43.7; Bangladesh manufacturing 10.0; India mining 42.0; Republic of Korea agriculture 90.0; Kazakhstan agriculture 15.6.

CHINA (CHN)					
Country	Reported Fatality Rate F_r	Employment E, million	Fatalities $F_r \times E$	Fatal Accidents reported to ILO	Notes
<i>China</i>	11.1	614.690	68,231	7,235	1994 State owned enterprises reported

italics = rate based on FSE average calculated value

TABLE 4

OTHER ASIA AND ISLANDS						
Country	Reported Fatality Rate F_r	Employment E, million		Fatalities $F_r \times E$	Fatal Accidents reported to ILO	Notes
<i>Bangladesh</i>	11.00 ⁷	56.160	47% 119.5	6,178		1994 ⁴
<i>Cambodia</i>	11.00	3.780	43% 8.8	415		1994 ⁴
<i>Comores</i>	11.00	0.220	38% 0.6	24		1994 ⁴
Fiji	40.00	0.240	35% 0.7	96		1992 ⁴
Hong Kong	10.90	2.915		318	255	1994 ⁶
Indonesia	43.70	78.104	1992	34,131	2,681	1992 ^{1,5}
<i>Korea, D. Rep. of</i>	11.00	10.170	45% 22.6	1,118		1994 ⁴
Korea Republic of	34.00	19.837		6,745	2,662	1994
<i>Laos</i>	11.00	2.470	55% 4.5	272		1992 ⁴
<i>Macau</i>	11.00	0.173		19	16	1994
Malaysia	11.00	7.645		840	534	1995
<i>Myanmar</i>	11.00	16.817		1,850		1994
<i>Nepal</i>	11.00	8.240	40% 20.6	906		1992 ⁴
Pakistan	36.26	33.047		11,984		1992 ²
Philippines	19.20	25.166		4,832	220	1994 ³
<i>PNG</i>	11.00	1.920	47% 4.1	211		1992 ⁴
Singapore	10.50	1.649		173	65	1994
<i>Sri Lanka</i>	11.00	5.148		566		1994
Thailand	19.20	32.095		6,162	820	1994
<i>Vietnam</i>	11.00	34.050	47% 69.5	3,746		1992 ⁴
TOTAL	23.12	339.840		80,586		1994

1 = based on some 6 million employees

 2 = manufacturing $F_r = 17.5$

3 = based on Thailand

4 = Human Development Report Labour Force, 1994

5 = including commuting accidents

6 = including commuting accidents and diseases

 7 = dockers $F_r = 41.0$

italics = data not available, rate based on Malaysian average rate

TABLE 5

SUB SAHARAN AFRICA (SSA)			
Reported Fatality Rate F_r per 10^5	Employment E, million	Fatalities $F_r \times E$	Notes
21.0	218.400	45,864	Employment 39% of 560 million ¹ , fatality rate based on Zimbabwe, 1995

1 = Human Development Report, UNDP, 1994

LATIN AMERICA AND CARIBBEAN (LAC)			
Reported Fatality Rate $F_r/10^5$	Employment E, million	Fatalities $F_r \times E$	Notes
13.5	195.000	26,374	F_r = based on Brazilian rate (13.5); E = 44% of ¹ 444 million ²

1 = Human Development Report, UNDP, 1994
2 = Global Burden of Disease, 1996, p.493

Other fatality rates: Bolivia 12.5; Colombia 14.1; Mexico 12.0; Panama 22.0; Guatemala 25.0

MIDDLE EASTERN CRESCENT (MEC)			
Reported Fatality Rate $F_r/10^5$	Employment E, million	Fatalities $F_r \times E$	Notes
22.5	186.000	41,850	F_r based on weighed average rate in Turkey 28.3 - $E=25,537,000$ and Egypt 12.0 - $E=15,241,400$ E = 37% of ¹ 503 million ²

1 = Human Development Report, UNDP, 1994
2 = Global Burden of Disease, 1996, p. 497

Other fatality rates: Bahrain 16.5 (1995); Jordan 8.2; Tunis 9.1; Cyprus, fishing 298.1 (1994); Egypt, agriculture 13.0 (1994); Turkey, agriculture 39.9 (1994).

FATAL OCCUPATIONAL ACCIDENTS IN THE WORLD - ESTIMATES

TABLE 6

ALL REGIONS				
Region	Fatality Rate F _r /10 ⁵	Employment E, million	Fatalities F _r x E	Notes
EME	5.3	366.437	19,662	World Labour Force 2.7 billion
FSE	11.1	140.282	15,563	
IND	11.0	334.000	36,740	
CHN	11.1	614.690	68,231	
OAI	23.1	339.840	80,586	
SSA	21.0	218.400	45,864	
LAC	13.5	195.000	26,374	
MEC	22.5	186.000	41,850	
WORLD	14.0	2,394.667	334,870	

EME	Established Market Economies	OAI	Other Asia and Islands
FSE	Formerly Socialist Economies of Europe	SSA	Sub-Saharan Africa
IND	India	LAC	Latin America and the Caribbean
CHN	China	MEC	Middle Eastern Crescent

DIVISION AND CATEGORIES OF OCCUPATIONAL INJURIES

TABLE 7

