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When United Nations (UN) Peacekeeping Operations was awarded the 1988 Nobel Peace Prize, Secretary-General Javier Perez de Cuellar, paid tribute to the 733 “blue helmets” who had lost their lives over 40 years “in the service of peace.”1 Just 1 decade later, the total number of peacekeepers killed in this “grand experiment, in which soldiers were used as a catalyst of peace, rather than as instruments of war,”2 had more than doubled, exceeding 1500 by the fiftieth anniversary of UN Peacekeeping Operations in 1998.3 This mirrored the rise in casualties and fatalities reported among field workers from different humanitarian organizations.4-6

Two reasons have been given for this large increase in peacekeeping fatalities. First, the increase in number and scale of peacekeeping operations conducted since the end of the Cold War7-10, and second, the changes in nature and characteristics of peacekeeping missions that have made them more dangerous with higher fatality risks.10-12

While there are increased concerns voiced for the safety of UN peacekeepers, little is known about actual risks and any changes in these over time. By early 2000, there were more than 30,000 uniformed and civilian UN personnel deployed in 17 peacekeeping missions around the globe.8 Keeping missions around the globe.8 Better than 30,000 uniformed and civilian personnel were deployed to 17 peacekeeping missions around the globe.8

We undertook this study of peacekeeper deaths to assess trends, factors, and risks.

Context The rising number of deaths among United Nations (UN) peacekeeping forces after the Cold War has made some troop-contributing countries hesitant to participate in peacekeeping operations. While the number and scale of missions have increased, no data have demonstrated a parallel increase in risks to peacekeepers.

Objective To determine the association of characteristics of UN peacekeeping operations with risks and mortality rates among UN peacekeeping forces in both the Cold War and post–Cold War periods.

Design, Setting, and Participants Descriptive analysis of 1559 personnel deaths during 49 UN peacekeeping missions from 1948-1998 based on the casualty database maintained by Department of Peacekeeping Operations, UN Headquarters.

Main Outcome Measures Number and percentage of deaths by circumstance, total crude death rate, and crude death rate and relative risk of death by circumstance (hostile acts, unintentional violence, and illness or other causes) and time period (Cold War vs post–Cold War), geographic region, and nature of peacekeeping response; and regression analysis of mission variables (strength, duration, and humanitarian mandate) associated with total number of deaths.

Results More deaths have occurred among UN peacekeeping forces in the past decade alone than in the previous 40 years of UN peacekeeping (807 vs 752), but crude death rates did not differ significantly by time period (Cold War vs post–Cold War, 21.8 vs 21.2 deaths per 10,000 person-years; \( P = .58 \)), level of peacekeeping response, or for geographic regions other than East Europe and Central America, where rates were lower \( (P < .001 \) for both regions). Unintentional violence accounted for 41.2% of deaths, followed by hostile acts (36.1%), and illness or other causes (22.7%). Deaths from hostile acts increased after the Cold War (relative risk [RR] 1.51; 95% confidence interval [CI], 1.22-1.88), while rates for deaths caused by unintentional violence decreased (RR, 0.79; 95% CI, 0.67-0.94) but remain high, particularly in the Middle East and Asia (RR, 1.39; 95% CI, 1.15-1.69). Regression analysis showed a significant association between number of deaths and the strength \( (P < .001 \) and duration \( P < .001 \) of a peacekeeping mission.

Conclusion The increase in number of deaths among UN peacekeeping personnel since 1990 can be attributed to the increased number and scale of missions after the Cold War rather than increased RR of death. Post–Cold War peacekeeping personnel have a higher risk of dying from hostile acts in missions where more force is required. In missions providing or facilitating humanitarian assistance, both the RR of deaths from all causes and deaths from hostile acts are increased.

METHODS

Study Design

Fatality data for all reported deaths from UN peacekeeping missions from 1948 to August 1998 were obtained from the casualty database maintained by the Situation Center and the Medical Support Unit. Descriptive analysis of 1559 personnel deaths during 49 UN peacekeeping missions from 1948-1998 based on the casualty database maintained by Department of Peacekeeping Operations, UN Headquarters.
port Unit, UN Department of Peacekeeping Operations, New York, NY.

Casualty data were based on individual reports submitted by the field mission headquarters within 24 hours of each incident, a requirement for all mission-related fatalities, serious injuries, and illnesses involving UN personnel, both international and local.\textsuperscript{13} Deaths among locally contracted civilian staff may have been underreported. Aggregated data available included fatality counts by individual missions and the number of deaths for each incident category as initially reported. Mission-related variables were obtained from official records and publications of the UN Department of Peacekeeping Operations.\textsuperscript{8,14} Independent variables that were assessed were circumstances and time period (before or after 1990) of death, geographic region of mission, and level and duration of peacekeeping response.

Circumstances of Death. Hostile acts were defined as deaths from intentional violence of political, criminal, or of undetermined hostile origin; the UN classification for deaths due to accidents was defined as deaths from unintentional violence of all causes; and illness and other causes as deaths from disease, “natural causes,” and unknown causes.

Time Period. 1990 was arbitrarily taken to divide the Cold War and post–Cold War periods. For missions that extended across this time line, the assumption was made that distribution of deaths was uniform throughout the entire mission duration. The 1960 United Nations Mission in Congo (ONUC) has been described as controversial and atypical of missions conducted in the Cold War period because nearly 20000 personnel were deployed in direct military operations and the highest number of fatalities of any UN mission were sustained (250 reported deaths).\textsuperscript{15} Because ONUC resembled a peace enforcement operation more typical of the post–Cold War period than the traditional peacekeeping missions of the Cold War period, it has been excluded from Cold War vs post–Cold War analysis.

Geographic Region. For analysis, peacekeeping operations were grouped as Africa, Eastern Europe, Middle East (including Cyprus), Asia, and Central America.

Level, Strength, and Duration of Peacekeeping Response. Level 1 response comprises traditional peacekeeping missions involving only unarmed military observers or civilian police monitors.\textsuperscript{16} Level 2 responses encompass both traditional and multidisciplinary missions deploying armed military units, for example, in operations like interposition of peacekeeping forces between belligerent forces or their preventive deployment against escalation of hostilities.\textsuperscript{16} Level 3 response (peace enforcement) comprises operations conducted with a mandate authorizing use of all measures necessary, including military force, to maintain or restore international peace and security in accordance with Article 42, Chapter VII, of the UN Charter.\textsuperscript{16,17} When the mission level changed as a result of amendments to the mandate, the higher level was used. A humanitarian mandate is defined as the specific task given to peacekeeping missions to provide or to facilitate the delivery of humanitarian assistance, which is common in complex humanitarian emergencies occurring in unstable situations with poor security. Strength of mission was determined by number of troops. Duration of mission was measured from first deployment of all UN peacekeeping personnel or until their replacement by a new UN peacekeeping mission under a separate mandate of the UN Security Council or departure of all troops.

Data Analysis
The actual strength of each peacekeeping mission varied according to the security situation, amendments to mission mandates, and different mission phases, with fewer peacekeepers deployed during the build-up and liquidation phases. Fatality rates in person-years were estimated for each mission, based on the denominator derived from the product of the official mission strength and total mission duration. For ongoing missions, strength as of August 1998 was used. United Nations electoral monitors were excluded from the denominator, as they were generally deployed for short periods, often less than a month. Data for locally contracted civilian staff were unreliable and excluded from analysis.

Relative risks (RRs) of death were calculated and presented at the 95% confidence interval (CI), and the independent effects of selected mission variables on the number of deaths were analyzed using multiple linear regression models on Intercooled Stata, version 6.0 (Stata Corporation, College Station, Tex). Confidence intervals were determined for RRs to indicate the level of precision within sample comparisons but not for the rates that were calculated for the total number of peacekeepers, which represent the universe of a unique sample.

RESULTS
We analyzed 1559 deaths from 49 UN peacekeeping missions. A chronological list of all missions up to August 1998, including estimated mission-specific fatality rates, is presented in TABLE 1. A total of 22 deaths (1.4%) was excluded from analysis because they involved UN headquarters personnel, who were not part of the peacekeeping force, or did not occur in peacekeeping operations. In 16 peacekeeping missions, there were no reported deaths. The highest number of deaths occurred in Congo (ONUC, 250 deaths), Lebanon (UN Interim Force in Lebanon [UNIFIL], 228 deaths) and former Yugoslavia (UN Protection Force [UNPROFOR], 212 deaths). The highest death rates were in Guatemala (UN Human Rights Verification Mission in Guatemala [MINUGUA]; death rate, 379.94) and Tajikistan (UN Mission of Observers in Tajikistan [UNMOT]; death rate, 296.30); however, the total numbers involved in these 2 missions were small (188 and 72, respectively), and the results may not be representative.

The crude and circumstance-specific death rates and RRs of death by mission variable are summarized in

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### Table 1. Number and Rate of United Nations Peacekeeping Operations Fatalities by Mission as of August 1998

<table>
<thead>
<tr>
<th>Mission Name</th>
<th>Location</th>
<th>Mission Duration</th>
<th>Mission Strength, No. Deaths, No. Death Rate, per 10 000 Person-Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>UNTSO†</td>
<td>Israel</td>
<td>1948-present</td>
<td>153 38</td>
</tr>
<tr>
<td>UNMOGIP†</td>
<td>India-Pakistan</td>
<td>1949-present</td>
<td>45 9 40.20</td>
</tr>
<tr>
<td>UNEFI</td>
<td>Middle East</td>
<td>1956-1967</td>
<td>6073 106</td>
</tr>
<tr>
<td>UNGIL</td>
<td>Lebanon</td>
<td>June 1958–December 1958</td>
<td>591 0</td>
</tr>
<tr>
<td>ONUC</td>
<td>Congo</td>
<td>1960-1964</td>
<td>19828 250</td>
</tr>
<tr>
<td>UNSF</td>
<td>West New Guinea (West Irian)</td>
<td>1962-1963</td>
<td>1576 0</td>
</tr>
<tr>
<td>UNYOM</td>
<td>Yemen</td>
<td>1963-1964</td>
<td>189 0</td>
</tr>
<tr>
<td>UNFICYP†</td>
<td>Cyprus</td>
<td>1964-present</td>
<td>1268 168</td>
</tr>
<tr>
<td>UNIPOM</td>
<td>India-Pakistan</td>
<td>1965-1996</td>
<td>96 0</td>
</tr>
<tr>
<td>DOR REP</td>
<td>Dominican Republic</td>
<td>1965-1966</td>
<td>3 0</td>
</tr>
<tr>
<td>UNEFII</td>
<td>Middle East</td>
<td>1973-1979</td>
<td>6973 55</td>
</tr>
<tr>
<td>UNDOF†</td>
<td>Israel-Syria (Golan Heights)</td>
<td>1974-present</td>
<td>1042 39</td>
</tr>
<tr>
<td>UNIL†</td>
<td>Lebanon</td>
<td>1978-present</td>
<td>4455 228</td>
</tr>
<tr>
<td>UNMOG</td>
<td>Iran-Iraq</td>
<td>1988-1991</td>
<td>400 1</td>
</tr>
<tr>
<td>UNGOMAP</td>
<td>Afghanistan-Pakistan</td>
<td>1988-1990</td>
<td>50 0</td>
</tr>
<tr>
<td>UNTAG</td>
<td>Namibia</td>
<td>1989-1990</td>
<td>8000 19</td>
</tr>
<tr>
<td>UNAVEMI</td>
<td>Angola</td>
<td>1989-1991</td>
<td>70 0</td>
</tr>
<tr>
<td>ONUCA</td>
<td>Central America</td>
<td>1989-1992</td>
<td>1000 0</td>
</tr>
<tr>
<td>UNAVEMII</td>
<td>Angola</td>
<td>1991-1995</td>
<td>711 5  17.94</td>
</tr>
<tr>
<td>MINURSO</td>
<td>Western Sahara</td>
<td>1991-present</td>
<td>521 9 23.28</td>
</tr>
<tr>
<td>UNIKOM</td>
<td>Kuwait</td>
<td>1991-present</td>
<td>1099 13</td>
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<td>UNAMIC</td>
<td>Cambodia</td>
<td>1991-1992</td>
<td>1504 0</td>
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<td>ONUSAL</td>
<td>El Salvador</td>
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<td>ONUMOZ</td>
<td>Mozambique</td>
<td>1992-1994</td>
<td>8994 24</td>
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<td>UNSOMI</td>
<td>Somalia</td>
<td>1992-1993</td>
<td>4469 8 17.90</td>
</tr>
<tr>
<td>UNPROFOR</td>
<td>Yugoslavia</td>
<td>1992-1995</td>
<td>38599 212</td>
</tr>
<tr>
<td>UNTAC</td>
<td>Cambodia</td>
<td>1992-1993</td>
<td>22000 84</td>
</tr>
<tr>
<td>UNOMUR</td>
<td>Rwanda</td>
<td>1993-1994</td>
<td>81 0</td>
</tr>
<tr>
<td>UNAMIR</td>
<td>Rwanda</td>
<td>1993-1996</td>
<td>5500 26</td>
</tr>
<tr>
<td>UNSOMII</td>
<td>Somalia</td>
<td>1993-1995</td>
<td>30800 148</td>
</tr>
<tr>
<td>UNOMIL</td>
<td>Liberia</td>
<td>1993-1997</td>
<td>450 0</td>
</tr>
<tr>
<td>UNOMIG</td>
<td>Georgia</td>
<td>1993-present</td>
<td>96 3   61.52</td>
</tr>
<tr>
<td>UNMIH</td>
<td>Haiti</td>
<td>1993-1996</td>
<td>1858 8  15.21</td>
</tr>
<tr>
<td>UNASOG</td>
<td>Chad</td>
<td>May 1994–June 1994</td>
<td>15 0</td>
</tr>
<tr>
<td>UNMOT</td>
<td>Tajikistan</td>
<td>1994-May 2000</td>
<td>72 8 296.30</td>
</tr>
<tr>
<td>UNAVEMIII</td>
<td>Angola</td>
<td>1995-1997</td>
<td>4200 36</td>
</tr>
<tr>
<td>UMMIBH</td>
<td>Bosnia and Herzegovina</td>
<td>1995-present</td>
<td>716 4</td>
</tr>
<tr>
<td>UNTAES</td>
<td>Croatia</td>
<td>1996-1998</td>
<td>2847 11</td>
</tr>
<tr>
<td>UNMOP</td>
<td>Croatia</td>
<td>1996-present</td>
<td>114 0</td>
</tr>
<tr>
<td>UNSMIH</td>
<td>Haiti</td>
<td>1996-1997</td>
<td>1525 1  6.56</td>
</tr>
<tr>
<td>MONUA</td>
<td>Angola</td>
<td>1997-1999</td>
<td>1116 13 66.56</td>
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<td>MINUJUA</td>
<td>Guatemala</td>
<td>January 1997–May 1997</td>
<td>188 3</td>
</tr>
<tr>
<td>UNTMIH</td>
<td>Haiti</td>
<td>1997</td>
<td>300 0</td>
</tr>
<tr>
<td>MIPONUH</td>
<td>Haiti</td>
<td>1997–March 2000</td>
<td>389 0</td>
</tr>
<tr>
<td>MINURICA</td>
<td>Central African Republic</td>
<td>1998–February 2000</td>
<td>1365 1</td>
</tr>
<tr>
<td>UNOMSIL</td>
<td>Sierra Leone</td>
<td>1998-1999</td>
<td>104 0</td>
</tr>
<tr>
<td>UNPSG</td>
<td>Croatia</td>
<td>January 1998–October 1998</td>
<td>28 1</td>
</tr>
</tbody>
</table>

Hostile Acts
Unintentional Violence
Illness/Other

2.1 years for all other missions. Larger

Crude death rates between the Cold

War and post–Cold War periods did not
differ significantly. However, the RR of
dying from hostile acts increased 1.51
times (95% CI, 1.22-1.88; P<.001),
with hostile acts accounting for 24.1%
of all deaths during the Cold War and
37.6% of all deaths in the post–Cold War
period. The RR of dying from un-


There have been more UN peace-

keeping missions in Africa than in any
other region (16 out of a total of 49),
with 5 of the 10 largest peacekeeping
missions in Africa (34.5%). Of the 10 peace-
keeping missions in the Middle East, 7 were
among the longest conducted by the UN,
with a median duration of 9.1 years
(range, 0.6-50.3 years) compared with
2.1 years for all other missions. Larger
numbers of deaths were observed for
these extended missions, although the rates
were not necessarily higher be-

cause deaths were distributed over
longer periods. For example, the mis-

sions in Cyprus (UN Peacekeeping
Force in Cyprus [UNFICYP]: duration,
36 years) and Lebanon (UN In-

terim Force in Lebanon [UNIFIL]: du-

ration, 21 years) sustained a total of 168
and 228 fatalities, respectively.

There were no significant differ-
ces in crude death rates among dif-
ferent levels of peacekeeping re-
ponse. However, the RR of dying from
hostile acts was more than twice as great
for level 3 response (peace enforce-
ment) compared with a level 1 or 2 re-
ponse. The presence of a mandate to
provide or to facilitate humanitarian as-
sistance increased RR of death 1.40
times (95% CI, 1.24-1.61; P<.001),
and increased RRs of dying from hostile acts
2.20 times (95% CI, 1.73-2.84; P<.001)
and from illness 1.37 times (95% CI,
1.05-1.80; P=.02).

The results of regression analysis
modeling are shown in TABLE 3. A sig-
nificant positive correlation was found
between the total number of deaths and
both the strength and duration of a
peacekeeping mission. If all other inde-
pendent variables were held constant,
an increase of 5.27 deaths (95% CI, 3.58-
6.95; P<.001) would be anticipated for
every 1000 personnel deployed and an
increase of 2.12 deaths (95% CI, 1.05-
3.19; P<.001) for each additional mis-


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significant correlation between the number of deaths and the mission area, level of peacekeeping response, or the presence of a humanitarian mandate.

**COMMENT**

We found that while there were more deaths among UN peacekeeping personnel in the post–Cold War decade compared with the previous 40 years of peacekeeping operations, there was no significant increase in the crude death rate. This is contrary to the general perception that post–Cold War missions have become more risky for peacekeepers.12,13 The increased number of deaths is largely accounted for by increases in number and scale of UN peacekeeping operations. In the 4 decades between 1948-1989, the UN undertook 18 peacekeeping missions, of which 9 (50%) comprised more than 1000 persons. In the past decade alone, there were 31 missions, of which 17 (55%) comprised more than 1000 persons.14 At the peak of peacekeeping activities in 1993, there were more than 80,000 deployed military and civilian personnel, with more than 38,000 peacekeepers in former Yugoslavia alone.8 In contrast, the only ambitious peacekeeping operation undertaken during the Cold War was in Congo from 1960-1964 (UNOC).15 All other missions in that period were much smaller in scale.

There were no significant differences in crude death rates among different levels of peacekeeping response and among most mission areas, with the exception of East Europe and Central America, where rates were lower. This does not confirm the beliefs of military planners that limited operations carry higher casualty rates than those in which a larger decisive force is employed.28,29 While this finding might be confounded by the greater likelihood of deploying large peacekeeping forces in more dangerous missions, it suggests that the overall risk of death for individual peacekeepers may not vary with differences in these mission variables. It might be that overall peacekeeping fatalities could be reduced by deploying a smaller number of well-trained peacekeepers, rather than larger multinational forces that include military units from countries with limited experience in complex peace support operations.21

Peacekeeping missions with a mandate to provide or facilitate humanitarian assistance were associated with higher crude death rates and with greater risks of dying from hostile acts and illness, which may reflect the instability and poorer conditions encountered.10-12 However, in the regression analysis model, the presence of a humanitarian assistance mandate does not predict an increase in the number of deaths. Overall, unintentional violence remained the most common cause of death, but our findings showed that there has been a significant decrease over time in the RR of dying from unintentional violence. This might be explained by better preventive measures, as well as improved medical support for casualties.13,22

An alarming trend is the higher risk of death from hostile acts after the Cold War. Risk factors include missions in Africa, level 3 (peace enforcement) operations, and missions with a humanitarian assistance mandate. This may have resulted from the increasing use by the UN of a military approach to address complex political emergencies, a process referred to as “military humanitarianism,” the key difference being the level of force and offense employed.10-12 In peace enforcement, peacekeepers are often deployed in the midst of civil war between parties that had not all consented to intervention and, with no peace to keep, find themselves drawn into the conflict.12,22 While authorized to use “all means necessary” to achieve its mandate,17 strict rules of engagement often leave peacekeepers at a disadvantage in coping with hostile actions directed against them.24 Deaths occurring in such situations have received high political and media attention, examples being the missions in Somalia (UN Operation in Somalia [UNOSOM]) and Rwanda (UN Assistance Mission in Rwanda [UNAMIR]). Such attention has led the UN and various troop-contributing countries to review their peacekeeping commitments and to set new conditions for involvement in future operations.25,26 Crude death rates for these 2 missions, however, were not significantly higher than for other missions that continue to receive broad international support.

There are no comparable data for deaths among civilian humanitarian workers. There are similar perceptions of increasing numbers of deaths and increased risks.4,6,27 Many humanitarian organizations have only recently begun to document staff deaths in detail and to keep accurate records of field staff strength, data that are needed to provide denominators for risk calculations.4 Observational studies and analysis of secular trends over time conventionally have been used to study warfare28,29 and can be useful in tracking civilian humanitarian deaths as well. Because of the dynamic nature of current conflicts, with frequent exacerbations and remissions, mortality trends among both civilian humanitarian workers and peacekeeping forces are likely to shift as security and other risk factors change. This points to the need for continuous casualty and mortality surveill-

**Table 3. Regression Analysis of Modeling Mission Variables Associated With Total Number of Deaths in United Nations Peacekeeping Operations***

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Regression Coefficient</th>
<th>Correlation Coefficient</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>-7.93</td>
<td>.30</td>
<td></td>
</tr>
<tr>
<td>Mission strength, per 1000 persons</td>
<td>5.27</td>
<td>0.71</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Mission duration, per 1 year</td>
<td>2.12</td>
<td>0.29</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Humanitarian mandate†</td>
<td>20.07</td>
<td>0.49</td>
<td>.15</td>
</tr>
</tbody>
</table>

**Footnotes:**

*Geographic region and level of peacekeeping response were not significant predictors of death and were dropped from the analysis.
†Dummy variable with absence of humanitarian mandate as the reference category.
lance for all parties striving to bring relief and stability to the chaos that will continue to characterize the post–Cold War era in many parts of the world.

CONCLUSIONS

The number of deaths in UN peacekeeping missions in the post–Cold War decade was 807, compared with 752 in the previous 40 years. However, there has been no significant rise in crude death rates, with the increase in numbers of deaths largely explained by the UN’s greater commitment of military forces to such operations. Extended missions and large-scale peace-enforcement operations accounted for the largest number of fatalities, although the individual risks of dying in these missions were generally not greater. There was an increased RR of dying from hostile acts after the Cold War, with risk factors including missions in Africa, level 3 (peace enforcement) operations, and missions with a humanitarian mandate. There was a decreased risk of death from unintentional violence, and no differences in death rates from illness and other causes. This study provides a simple model for estimating death rates in UN peacekeeping operations.

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