Paul Dudley White
(June 6, 1886-October 31, 1973)

Rene Favaloro
(October 6, 1923-July 29, 2000)
CHANGE IN THE RANK ORDER OF DISEASE BURDEN FOR 15 LEADING CAUSES, WORLD, 1990-2020 (DALYS)

- Lower resp inf: 1
- Diarrh dis: 2
- Perinatal: 3
- Unipolar major dep.: 4
- Isch heart dis: 5
- Cerebrovasc dis: 6
- TB: 7
- Measles: 8
- Traffic accidents: 9
- Cong anomalies: 10
- Malaria: 11
- COPD: 12
- Falls: 13
- Iron-defic anaemia: 14
- Prot-energy malnut: 15

1990 → 2020:

1. Isch heart dis
2. Unipolar major dep.
3. Traffic accidents
4. Cerebrovasc dis
5. COPD
6. Lower resp inf
7. TB
8. War
9. Diarrhoeal dis
10. HIV
11. Perinatal
12. Violence
13. Cong anomalies
14. Self-inflicted injuries
15. Trach., bronch. & lung CA

16, 17, 19, 28, 33
19, 24, 25, 37, 39
THE POWER TO DESTROY:
EST ANNUAL AVERAGE MILITARY DEATHS WORLDWIDE

<table>
<thead>
<tr>
<th>CENTURY</th>
<th>AVGE ANN MILITARY DEATHS</th>
<th>WORLD MID-CENTURY POPULATION (Millions)</th>
<th>AVGE ANN MILITARY DEATHS PER MILLION</th>
</tr>
</thead>
<tbody>
<tr>
<td>17TH</td>
<td>9,500</td>
<td>500</td>
<td>19.0</td>
</tr>
<tr>
<td>18TH</td>
<td>15,000</td>
<td>800</td>
<td>18.8</td>
</tr>
<tr>
<td>19TH</td>
<td>13,000</td>
<td>1,200</td>
<td>10.8</td>
</tr>
<tr>
<td>20TH</td>
<td>458,000</td>
<td>2,500</td>
<td>183.2</td>
</tr>
</tbody>
</table>
Number of armed conflicts by level 1946-2000

- Minor
- Intermediate
- Major (over 1000 deaths a year)
Percent of Civilian Deaths in Selected 20th Century Wars

<table>
<thead>
<tr>
<th>Period</th>
<th>Percent of Civilian Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>WWI</td>
<td>14%</td>
</tr>
<tr>
<td>WWII</td>
<td>67%</td>
</tr>
<tr>
<td>1980s</td>
<td>75%</td>
</tr>
<tr>
<td>1990s</td>
<td>90%</td>
</tr>
</tbody>
</table>

“War and Public Health”. Levy & Sidel
## Impact of War (1)

<table>
<thead>
<tr>
<th>Time Period</th>
<th>Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 1900</td>
<td>9 out of 10 deaths in a conflict occurred in combatants</td>
</tr>
<tr>
<td>After 1900</td>
<td>9 out of 10 deaths in a conflict occurs in noncombatants</td>
</tr>
<tr>
<td>Before 1900</td>
<td>In a war, more people died from infections than direct injuries</td>
</tr>
<tr>
<td>After 1900</td>
<td>In a war, more people died from injuries than infections</td>
</tr>
</tbody>
</table>
Impact of War (2)

Before 1900, Most wars between countries

Recent Most recent wars are internal

Before 1900, Limited environmental impact

Recent Substantial long-term impact
July 16, 1945: First nuclear explosion in the Mojave desert, New Mexico

“I am become death, destroyer of worlds” (J. Robert Oppenheimer)
Nuclear Weapons

• 21 days later: Hiroshima bombing 100,000 dead, 150,000 injured
• 3 days later: Nagasaki bombing 70,000 dead, 30,000 injured
• 1950’s: Fusion (H2 bomb) replaces fission (atomic bomb), 1000 times more powerful than the Hiroshima bomb
• Subsequently >1200 nuclear test explosions
• Mid-1980’s: 50,000 nuclear warheads=1 million times the explosive force of Hiroshima (3 tons for every person on the planet)
Relative Risks by Estimated Radiation dose (in rads) for leukemia & 4 other malignancies, based on studies of atomic-bomb survivors in Japan

“War and Public Health”. Levy & Sidel
“If there is another Hiroshima, there will be no one left to record the sadness”

Epilogue to the Hiroshima Peace Memorial
Prevention of Nuclear War

• Mainly education that a nuclear war is un-winnable
  • US Gov’t estimates in 1980; 20% (45 million) US population would die!
  • In a war between the US and Soviet claim, after a first round of strikes about 1 to 3 billion individuals would die

• No medical intervention possible
• No cure; only prevention
• Minimize and avoid the social and cultural conditions that lead to war

IPPNW and PSR play major roles
Impact of War on Civilians and on Human Rights

Direct Assaults on Civilians*

- 1930 bombing of Ethiopian civilians by Italian planes, Spanish civilians in Guernica by German planes
- Japanese assaults in China
- Bomb attacks on London & Coventry in WWII
- Incendiary bombings of Dresden, Hamburg and Tokyo (100,000 killed in one day)
- Hiroshima (70,000 deaths on 1st day) Nagasaki (30,000)
- Vietnam
- Afghanistan, Iraq by ICBM
- Yugoslavia (shelling of Vukovar, Dubrovnik, Zvornik, Srebenica, Mostar, Bihac & Sarajevo)
- Grozny, Chechnya (4000 detonations/hr)

*Outlawed by Hague Convention 1907, Geneva Convention 1949*
Impact of War on Civilians and on Human Rights

Ethnic cleansing and extra judicial killings
“Forced removal of civilian population from their homes and land on the basis of religion, nationality, or ethnic identity”

• Holocaust
• Stalin’s Progroms
• Pol Pot’s Cambodia (intellectuals and educated)
• Rwanda
• Yugoslavia…Sri Lanka, E. Timor, Armenia, Azerbaijan, Ossetia & Georgia, China and Tibet, Iraq & Kurdistan, etc

Outlawed by Hague Convention 1907, Geneva Convention 1949
Indirect Assault on Civilian Populations

- Destroying infrastructure (e.g. Iraq)
  - Electricity
  - Water and Sewage systems
  - Hospitals

500,000 excess childhood deaths in 10 years
The Best Thing a Boy Can Do?
Children as Soldiers

- In the last decade >200,000 recruited into armies (some seven/eight years old)
- Forcibly recruited; often forced to kill family
- Drugs
- Sexually abused
- Used to clear mines*

*100 million unexploded mines (1 for every 20 children)

HIV risk
Deaths in Conflicts in the last decade

- 2 million children killed
- 4-5 million handicapped/disabled
- 12 million homeless
- 1 million orphaned/separated from parents
- 10 million psychologically traumatized
  (1/200)
Children and Post War Traumatic Syndrome

Causes:

• 1991 survey in Iraq: 62% of children did not expect to live to become adults

• Mozambique: of 50 children, 42 had lost a parent, 29 had witnessed a murder, 16 had been kidnapped. All had been threatened, beaten, or starved

• 1994 Rwanda: 50% of children had witnessed a killing of a family member, 75% had witnessed a murder, 50% had witnessed mass killings (churches and schools)

....a child points to a skull and said “This is my mother”
Health as a Bridge to Peace: Guerillas vaccinating children “Zones of Tranquility”

Lancet 2002
Environmental Consequences of War

“War and Public Health”. Levy & Sidel
Environmental Consequences of War

- Destruction of Human Habitat (Hiroshima, Nagasaki, Hamburg, Dresden, Tokyo, Vietnam, Central America, Gulf War, etc)
- Damage to Physical Facilities (dams, power stations, water supply, hospitals, roads, airports)

  In 1938 in the 2nd Sino-Japanese war, Chinese dynamited a dike on the Yellow River drowning several thousand Japanese soldiers and several hundred thousand Chinese civilians, destroyed 11 cities, 4000 villages and several million hectares of farmland

- Destruction from high explosives
Environmental Consequences of War

• Impact of Herbicides and defoliants (e.g. Vietnam)
  - destruction of millions of trees – 20 million sq m of timber
  - 135,000 hectares of rubber
  - 124,000 hectares of mangroves
  - widespread soil erosion
  - decimation of wildlife (direct and decimation of habitat)
  - loss of freshwater fish and decline in offshore fishery

Dioxin has a life of >20 years and gets into breast milk

• Pollution (black rain, smoke, resp particles)
Environmental and Health Effects of Weapons Production, Testing and Maintenance (1)

Land and air battlefields have expanded by 50,000/soldier since ancient times, e.g. WWII: mechanized infantry battalion needs 16 sq km vs in 2000: 320 sq km

WWII a fighter plane’s radius was 9 km: in 2000, 75 km and in the future 150 to 200 km for next generation of jets

Military uses 2% of land in the US, more land for military use in Kazakhstan, than growing wheat

In Germany, damage from military exercises costs $100 million/yr (damage to soil, crops, and property) + long term consequences to soil, unexploded bombs, contaminations

In the US, 30% to 50% of airspace is designated for military training

In Canada, the zone assigned to Goose Bay Air Force in Labrador is >100,000 sq km (larger than N. Brunswick) Sonic boom carries >10 km and is harmful to animals and humans
## Energy Consumption of Selected Military Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Operating Distance or Times</th>
<th>Fuel Consumption (liters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>M-1 Abrams tank, average use</td>
<td>1 kilometer</td>
<td>47</td>
</tr>
<tr>
<td>F-15 jet, at peak thrust</td>
<td>1 minute</td>
<td>908</td>
</tr>
<tr>
<td>M-1 Abrams tank, peak rate</td>
<td>1 hour</td>
<td>1113</td>
</tr>
<tr>
<td>F-4 Phantom fighter/bomber</td>
<td>1 hour</td>
<td>6359</td>
</tr>
<tr>
<td>Battleship</td>
<td>1 hour</td>
<td>10810</td>
</tr>
<tr>
<td>B-52 bomber</td>
<td>1 hour</td>
<td>13671</td>
</tr>
<tr>
<td>Non-nuclear aircraft carrier</td>
<td>1 hour</td>
<td>21300</td>
</tr>
<tr>
<td>Carrier battle group</td>
<td>1 day</td>
<td>1589700</td>
</tr>
<tr>
<td>Armored division 348 tanks</td>
<td>1 day</td>
<td>2271000</td>
</tr>
</tbody>
</table>

“War and Public Health”. Levy & Sidel
Drain on Energy/Materials

- One quarter of world jet fuel use is military (1980)
- Pentagon is the largest consumer of energy in the world (in 1 year, energy consumption by Pentagon = energy needed for the US mass transit system for 14 years!)
- World military energy consumption is larger than Japan’s (2nd largest economy)
- Contributes to 6-10% of global air pollution
- 60 million tons annually of iron/steel for military purposes
- Titanium, aluminum, copper, nickel and platinum use by military is larger than the entire use by developing countries
Toxic Effects of Weapons Production

- Groundwater contamination of drinking water, irrigation systems, killing fish
- Hazardous and chemical wastes (fuels, paints, pesticides, heavy metals, PCBs, cyanides, phenols, propellants, explosives)
- US military largest producer of hazardous waste in the world: ? 500,000 tonnes of toxic materials/yr (>top 5 US chemical companies combined)
- Nuclear waste (plutonium has a half-life of 24,000 yrs): 257 tons of weapons-grade plutonium + 1500 tons of highly enriched uranium, leak from Hartford’s underground tanks adequate for 50 bombs used in Nagasaki
- Nuclear facilities or tests (e.g. Hartford, USA, Kyshtym, Russia, Kazakhstan, Bikini Atoll): uninhabitable land or increased risk of cancers
- Costs of nuclear waste management in the US is $350 billion (or 3-5 million per nuclear warhead)
Soviet-made PFM-1 Air-delivered Plastic Antipersonnel Mine

“War and Public Health”. Levy & Sidel
Landmines

• 100 million mines in 64 countries
• Civilians (esp children/peasants) targeted
  – Destroys life and limb
  – Land not useable
  – Refugees fear returning to homes
• Removing landmines is very slow, e.g. in Afghanistan
  – UN has 112 demining teams
  – 15 years to demine priority zones
  – 4285 years to clear manually mines from 20% of territory!
• Cambodia has 4 million mines
  Antipersonnel mines not banned, but 22 European countries and the US agreed to a moratorium on sales of mines
“Every gun that is fired…is in the final sense, a theft from those who hunger and are not fed, those who are cold and not clothed. This world in arms is not spending money alone. It is spending the sweat of its labourers, the genius of its scientists, and the hopes of its children”

President Eisenhower, April 16, 1953
“Cross of Iron” speech
Rwandan Refugees

Afghanistan Refugee
Rwandan Hutu refugees

Refugees

BMJ/Lancet 2002
## Estimated Crude Mortality Rates* (CMRs) in Selected Refugee Populations, 1990-94

<table>
<thead>
<tr>
<th>Date</th>
<th>Host Country</th>
<th>Country of Origin</th>
<th>Baseline CMR</th>
<th>Refugee CMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 1990</td>
<td>Ethiopia</td>
<td>Sudan</td>
<td>1.7</td>
<td>6.9</td>
</tr>
<tr>
<td>June 1991</td>
<td>Ethiopia</td>
<td>Somalia</td>
<td>1.8</td>
<td>14.0</td>
</tr>
<tr>
<td>March-May 1991</td>
<td>Turkey/Iraq</td>
<td>Iraq</td>
<td>0.7</td>
<td>12.6</td>
</tr>
<tr>
<td>March 1992</td>
<td>Kenya</td>
<td>Somalia</td>
<td>1.8</td>
<td>22.2</td>
</tr>
<tr>
<td>March 1992</td>
<td>Nepal</td>
<td>Bhutan</td>
<td>1.3</td>
<td>9.0</td>
</tr>
<tr>
<td>June 1992</td>
<td>Bangladesh</td>
<td>Myanmar</td>
<td>0.8</td>
<td>4.8</td>
</tr>
<tr>
<td>June 1992</td>
<td>Malawi</td>
<td>Mozambique</td>
<td>1.5</td>
<td>3.5</td>
</tr>
<tr>
<td>August 1992</td>
<td>Zimbabwe</td>
<td>Mozambique</td>
<td>1.5</td>
<td>10.5</td>
</tr>
<tr>
<td>Dec 1993</td>
<td>Rwanda</td>
<td>Burundi</td>
<td>1.8</td>
<td>9.0</td>
</tr>
<tr>
<td>May 1994</td>
<td>Tanzania</td>
<td>Rwanda</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>June 1994</td>
<td>Burundi</td>
<td>Rwanda</td>
<td>1.8</td>
<td>15.0</td>
</tr>
<tr>
<td>July 1994</td>
<td>Zaire</td>
<td>Rwanda</td>
<td>1.8</td>
<td>102.0</td>
</tr>
</tbody>
</table>

*Deaths per 1,000 per month

“War and Public Health”. Levy & Sidel
Death Rate by Duration of Stay in Camp, Chambuta Camp, Zimbabwe, July-Aug 1992

Time since arrival in camp

<1 week: 7.4
1-4 weeks: 8.2
1-3 months: 2.5
4-6 months: 1.4
7-12 months: 1.8

“War and Public Health”. Levy & Sidel
Causes of Death and Their Avoidance in Internally Displaced Individuals/Refugees

- Highest death rates < 5 years and elderly
- Causes of deaths include diarrhoeal diseases, measles, acute respiratory infections, other infections (malaria, meningococcal, hepatitis E), nutrition deficiencies, acute malnutrition, micronutrient deficiency
- Relief programs
  - Identifying, treating and preventing infectious diseases
  - Adequate protection, and involvement of refugees in planning/implementation
  - Clean water, food and sanitation
  - Health info systems
  - Diarrhoeal disease control (ORT), immunization, basic curative services, feeding/supplementing vulnerable groups (young children, pregnant & lactating women, elderly)
Humanitarian Aid and Rebuilding

• Immediate results
  - Acute treatments
  - Food, Water, Sanitation, and Shelter
  - Avoidance and Treatment of Infectious Diseases

• Longer term needs:
  - Redeveloping infrastructure,
    maintaining peace and rehabilitation

Usually done by UN (UNHCR, UNICEF) and NGO’s (ICRC, IRC, MSF, etc) working together to provide food and medical relief and take public health measures.
Hippocrates refuses to treat Persian soldiers suffering from the Plague during the War against Greece
• Hippocrates rejects consultation with the King of Persia
• US Civil War and Crimean War: physicians did not serve the opposing side
• Henri Dunant (Battle of Solferino, 1859) organized medical services for the opposing wounded French and Austrian troops?
  International Conference in Geneva that founded the Red Cross, adopted the “Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field”
• Dunant received the first Nobel Peace Prize in 1901
Geneva Convention 1949

Over the next 80 years a number of treaties on treatment of war casualties

- Conv for the Amelioration of the Wounded, Sick and Shipwrecked Members of Armed Forces at Sea
- Conv relative to the Treatment of Prisoners of War
- Conv relative to the Protection of Civilian Persons in Times of War

All the above and original convention codified into a single document (Geneva Convention 1949). Ratified by 60 countries and applicable to all nations “customary law, the usages established among civilized people…the laws of humanity, and dictates of the public conscience”
Geneva Convention: Physician Rights and Obligations

Rights: Immune from attack, prompt repatriation if captured

Obligations:
1. Noncombatants: prohibited to engage/be party to acts of war
2. All wounded and sick (whether soldier or civilian, friend or foe) to be respected, protected and treated humanely
3. All receive medical assistance, order based on medical priority
4. Medical aid without any discrimination
5. Medical personnel shall exercise no physical or moral concern against civilians, in particular to obtain information
Conflicts for Medical Personnel

• “Preserving the Fighting Strength” vs. “Over Evacuation”
• Combatant vs noncombatant roles
  - Knights Hospitallers of St. John of Jerusalem
  - 1967, Howard Levy, a dermatologist in US army, court martialed for refusing to train special services aidmen
  - physicians involved in development of biologic weapons
  - Medical experimentation (vaccines on own soldiers to experiments on prisoners)
  - Self censorship of public doubts about the justness of a war
Roles of Physicians in War

1. Conscientious Objector

- absolute pacifism
- selective pacifism (selected war, selected weapons, selected acts)
“In the name of freedom the US is waging an unjustifiable war in Vietnam, and is causing incalculable suffering. It is the goal of the medical profession to prevent and relieve human suffering. My effort to pursue this goal is meaningless in the context of the war. Therefore, I refuse to serve in the Armed Forces in Vietnam; and so that I may exercise my profession with conscience and dignity, I intend to seek means to serve my country which are compatible with the preservation and enrichment of life”

300 medical students and young physicians
“I am refusing orders to be an accomplice in what I consider an immoral, inhumane, and unconstitutional act, namely an offensive military mobilization in the Middle East. My oath as a citizen-solder to defend the Constitution, my oath as a physician to preserve human life and prevent disease, and my responsibility as a human being to the preservation of this planet, would be violated if I cooperate.”

Yolanda Huet-Vaughn, Capt US Med Serv Reserve Corps
Roles of Physicians in War

2. Serve as a strict noncombatant, upholding the Geneva Conventions.

3. Support organizations that seek to
   - prevent war (UN, WHO, IPPNW, PGS, PSR, Red Cross)
   - document the horrors of war
   - provide emergency care in war (MSF, UNICEF)

4. Become politically active to pressure Governments to avoid wars (especially unjust), reduce military spending, and provide truthful information

5. Promote research in prevention and rehabilitation after war
Can medicine prevent war?

Imaginative thinking shows that it might

Salim Yusuf  Professor of medicine
Sonia Anand  Clinician scientist

Preventive Cardiology and Therapeutics Research Program, Division of Cardiology, McMaster University, Hamilton, Ontario, Canada L8L 2X2

Graeme MacQueen  Associate professor, religious studies
Centre for Peace Studies, McMaster University
How can Physician Researchers Help Prevent or Rehabilitate After a War?

- **PRIMORDIAL PREVENTION**: Make the health profession and policy makers aware of the root causes of war (poverty, large economic disparities, avoiding a culture of conflict, downsizing militaries, education and promoting the importance of peace)

- **PRIMARY PREVENTION**: Tackling the specific causes of particular conflicts, informing the public of the catastrophic consequences of wars (e.g. IPPNW, Med Act), banning certain weapons

- **EMERGENCY MANAGEMENT**: Better care for wounded, care of displaced persons, protecting civilians

- **REHABILITATION**: Individuals (combatants and noncombatants), societies (Healing and Peace Building)
Education for Peace

“Wars begin in the minds of men. It is therefore in the minds of men that we must construct the defenses of peace”

Preamble to UNESCO charter

“If you want peace, educate for peace”

Pr Rodrigo Carazo of Costa Rica
Education for Peace

• Is current university education too narrow and not preparing individuals for a world that is global? (Producing global illiterates)

• Why have educators failed to change in a changing world?
  – Departmental structure (single disciplinary structure is incapable of addressing multi-faceted problems)
  – Misunderstanding of international education
  – Narrow education of faculty (resistance to change)
Education for Peace

1981: Int Assn of Univ Presidents (IAUP) in Costa Rica, at the founding of the Univ for Peace (UN & UNESCO) propose development of prototype internationalized curricula.

3 week long symposia involving leaders from academia, business, government and media

Two universities developed core curricula (Gonzaga & Central Michigan)

Debated at the 1984, Bangkok IAUP conference

Then: NOTHING happened

“We were theoretical heroes, but practical cowards”
Education for Peace: the Success of the IAUP/UN Commission

- IAUP/UN Commission on Disarmament Education formed in 1991: goal to “expand teaching in disarmament”
- 3 teams set up to develop modules
  - Graduate and undergraduate (Steven Spiegel, UCLA)
  - Professional/Health Sciences (Victor Sidel, Einstein)
  - Arms control, environment & economy (Edward Page, Business Exec for National Security)
- Materials presented in Kobe, 1993 at the 10th meeting of IAUP
- Introduced to 14 lead universities in Phil, Thailand, Uganda, Kenya, Tanzania, Mexico, Argentina, Chile and Peru
- Host “Professor” and “visiting mentor”
Education for Peace: the IAUP/UN Commission (2)

- Rapidly adapted and adopted in all 14 univ + many other countries (90 univ by 1997)
- Modular approach and relevance: The IAUP/UN Commission material focuses on regional conflict, conventional arms, the arms trade, the dangers of nuclear proliferation among small countries, emergence of biological and chemical weapons in Third World states, the health and environmental impact of such weapons, peace economics, and defense conversion, relation of peace to economic and environmental improvement, civilian control of the military, and peace-building techniques like mediation, negotiation, preventive diplomacy, and confidence building.”
- Plans to expand to Balkans, Middle East, Japan, India, Indonesia, Korea, Vietnam, and Central and Eastern Europe
- “Start with the acorn, and not the oak”
- “Analytic approach vs propagandist approach”

Health and peace: time for a new discipline

In 1988 the World Health Assembly passed a resolution to eradicate poliomyelitis by the year 2000. In many ways the WHA initiative seems almost old-fashioned in its idealism, its confidence that global victories can be won for humanity through science, humanitarian ideals, reason, and hard work. How, asks the cynic, can anyone who has seen irrationality and horrors of the 20th century hold on to such confidence? What reason is there to believe that the success achieved with the smallpox campaign can be replicated?
McMaster University Course on Peace Through Health

- Basic Concepts of Peace
- Causes and effects of war: link to health
- Basic Concepts of Health/War and Violence
- Health and Security
- Culture, Health and Peace
- Linking Health to Peace (Public Health, Ethics, Human Rights, Economic, Environmental)
- Medical activism, humanitarian response to war
- Case studies: IPPNW: Multi-track Peace Building
  Afghanistan Project: Peace Education & Peace Building
  Iraq: Post war
  Child Health (Mental)

Neil Arya, Rob Stevens, Joanna Santa Barbara, Vic Neufeld, Graeme McQueen
HOPE Foundation Chair in Peace through Health at the Faculty of Humanities and Faculty of Health Sciences

Jointly located at the Center for Peace Studies and Population Health Research Institute, McMaster University
World military expenditure, 1993-2002

© SIPRI 2003
## Comparison of Military Expenditures and Peace Keeping Assessments in 1991

<table>
<thead>
<tr>
<th>Country</th>
<th>Military Expend (millions $)</th>
<th>Peacekeeping Ass (million $)</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech</td>
<td>723</td>
<td>3.2</td>
<td>223:1</td>
</tr>
<tr>
<td>Mex</td>
<td>662</td>
<td>0.9</td>
<td>717:1</td>
</tr>
<tr>
<td>France</td>
<td>41,400</td>
<td>37.8</td>
<td>1096:1</td>
</tr>
<tr>
<td>Nigeria</td>
<td>234</td>
<td>0.2</td>
<td>1,191:1</td>
</tr>
<tr>
<td>Britain</td>
<td>42,300</td>
<td>29.4</td>
<td>1,441:1</td>
</tr>
<tr>
<td>USA</td>
<td>304,500</td>
<td>151.0</td>
<td>2,016:1</td>
</tr>
<tr>
<td>China</td>
<td>12,000</td>
<td>4.8</td>
<td>2,520:1</td>
</tr>
<tr>
<td>Russia</td>
<td>224,100</td>
<td>60.3</td>
<td>3,714:1</td>
</tr>
<tr>
<td>India</td>
<td>7,200</td>
<td>0.4</td>
<td>19,816:1</td>
</tr>
<tr>
<td>Pakistan</td>
<td>2,800</td>
<td>0.059</td>
<td>47,522:1</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>896</td>
<td>0.005</td>
<td>182,485:1</td>
</tr>
<tr>
<td>WORLD</td>
<td>921,500</td>
<td>491.0</td>
<td>1,877:1</td>
</tr>
</tbody>
</table>
What is the most wonderful thing in the world? asks Yama Man after man dies; seeing this, men still move about as if they were immortal, replies Yudishthira”

Vedanthas
GDP per person in Western Europe, $’000, 1990 prices

Take-off
GDP per person in Western Europe, $’000, 1990 prices

Mechanisation in farming; steam engines; Arkwright’s spinning machine (1769); Crompton’s mule (1779); bridge at Coalbrookdale, England, first structural use of cast iron (1779)

Volta’s electric battery (1800); electromagnetic telegraph (1833); first transatlantic telegraph cable (1858); Bell’s telephone (1876); Edison’s carbon-filament lamp (1878); Marconi’s wireless patent (1896)

First telescopes; Huygens invents pendulum clock (1658)

Bessemer and Siemens-Martin (open-hearth) processes for making steel

Car powered by internal-combustion engine (1885); Henry Ford’s Model T (1908)

Powered flight (1903)

Source: Angus Maddison

The Economist 1999
Poverty and Deprivation (1994)

1. One billion live in absolute poverty.
2. 900 million illiterate
3. 2 billion denied potable water
4. 100 million homeless
5. 800 million go hungry every day
6. 150 million < 5 yr olds undernourished

80:20 gap: 20% of the world controls 80% of the resources and wealth
MARKET FORCES: “Trickle Down Effects”

“If the horse is fed amply with oats, some will pass through to the roads for sparrows”

US: In the last 20 years, the income of the richest 30% has increased by 30%. Whereas the poor are worse off by 21%.
Official Development Assistance as a Percent of Military Expenditures, 1994

Percent of military expenditures

USA: 4, UK: 9, Germany: 20, France: 20, Canada: 24, Japan: 30, Norway: 34, Netherlands: 37, Sweden: 38, Denmark: 54

“War and Public Health”. Levy & Sidel
860 Israelis have been killed during Palestinian-Israeli conflict in the last three years – 243 from suicide bombers. (AP, September 2003)
Demolishing homes in West Bank and Gaza

2417 Palestinians have been killed during the Palestinian-Israeli conflict in the last three years – including 101 suicide bombers. (AP, September 2003)
Oklahoma City World Trade Center

April 19, 1995
168 people killed

September 11, 2001
3066 people killed (including Pentagon/aircraft)
Terrorist (1)

TER: Terrible, Deterrent, Turmoil
Tremere, Tremble, Tremulous

Terror used sometimes by insurgents, but more commonly by governments (e.g. Ancient Greek Tyrants in 5 BC who ruled by fear; tyrannicide encouraged)

Aristotle warned: Tyranny and extreme democracy could be equally degrading
1789: Formation of the Breton club (a left wing political debating club) in Versailles, which moved to a Dominican monastery (Jacobin Club)

Members involved in “terrorism” (1794 Le Tribune du peuple) during the Reign of Terror

First, the terrorists terrorized the aristocrats. After seizing power, they terrorized the people, then anybody they objected to including each other. (Robespierre, Hébert, Danton, Desmoulins, Saint Just, Couthon)
19th Century: “A member of a clandestine or expatriate organization aiming to coerce an established govt by acts of violence against it or its subject” (Oxford English Dictionary)

“One man’s terrorist is another man’s freedom fighter”

“The Terrorist and the policeman both came from the same basket. Revolution, legality– counter-moves in the same game.” Joseph Conrad in “The Secret Agent”
Psychology of Terrorist Groups

• “Non-violent people who use violence as a tool to what seems a reasonable end” (Kramer)
• Scant resources, but achieve an impact out of proportion to the physical damage
  – Anthrax scare in the US (“mass sociogenic disease”)
  – Codes, increased security, military spending, human rights violations after 9/11
  – “A lot of people watching, not a lot of people dead” (McCauley, Rand Corp)
Combating Terrorism

- Using military means can be more dangerous to the governments than terrorists (legitimacy is eroded, citizens sacrifice rights, enemies multiplied)
  - e.g. Israel vs Palestinian groups
  - ETA movement (“Basque” ideal) vs terror squads by Spanish gov’t
- Rational government response: “do nothing more than what the same violation would provoke if it were a criminal act without political resonance” McCauley 1991, Colvard 1999
A New Societal Contract?

- A basic needs contract to overcome marked inequalities
- A democratic contract to improve governments and governances across the world
- A cultural contract to foster dialogue and tolerance
- An earth contract for sustainable development

Jean-Jacques Rousseau 1762
Riccardo Petrella 1996
Rene Favaloro 1999
Do you believe in fairies?
“Without utopias, life is nothing but a long and sad rehearsal for death”

Joan Manuel Serrat
Prevention of War and Conflicts

1. Understanding and tackling the root causes of war (poverty, disparity, exploitation of people and resources)
2. Avoid alienation and demonisation of peoples identified by nationality, race, or religion
3. Identify early warning signs of a situation imminent for war
4. Supporting international organizations such as the UN, WHO, UNICEF, Red Cross, and promote resolution of disputes through peaceful negotiations and legitimizing the authority of the International Court of Justice, recognizing and abiding by international law.
5. Educating for Peace
6. Global Science Corp
Science for Peace

• Connect with the whole world (not just Western): visit, spend time, and even work in impoverished parts
• Share information, knowledge, expertise, and collaborate especially in solving some of the challenges
• Global Science Corps, Millennium Science Initiatives
• Help solve the medical problems of poor countries (micro level)
Triumphs in Biologic Sciences, but Health Failures

Malaria:
1902: Nobel prize for discovery of Plasmodium
2002: 50 million cases and 1-2 million deaths/year

Tuberculosis:
1905: Nobel prize for discovery of myc tuberculosis
1955: Nobel prize for discovery of streptomycin
2000: 8 million cases/year and 2 million deaths/year
Filtering Water to Prevent the Spread of Guinea Worm

Lancet 2002
Our Work in Developing Countries

• First links into S. America (EMERAS/ECLA) and E. Europe in CV trials
• Series of projects in India
  • 600 subject MI case control study
  • National 3600 subject study
  • Stroke Study
  • CREATE Registry > 15,000 MI in 70 hospitals
• INTER-HEART (52 countries)
• CREATE (RCT of GIK in India, China, Pakistan and Latin America of 20,000 MI’s)
• PURE (Goal of 100,000 individuals from 12 LIC and MIC followed for 10 yrs)
• Capacity building: Networks for Chagas disease (BENEFIT), Res Institutes (St. John’s in Bangalore)
View from the International Balkan Peace Team’s office in Dragash

Lancet 2002
“Where the mind is without fear and the head is held high;
Where knowledge is free;
Where the world has not been broken up into fragments by narrow domestic walls;
Where words come out from the depth of truth;
Where tireless striving stretches its arms towards perfection;
Where the clear stream of reason has not lost its way into the dreary desert sand of dead habit;
Where the mind is led forward by thee into ever-widening thought and action—
Into that heaven of freedom, my Father, let my country awake”

From Geetanjali, by Tagore