

Risk and Innovation in a Time of Rapid Transformations

A Global Outlook

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**STAMP Workshop
Zuerich, Sept. 15, 2016**

Misjudged Risks?



The Good News

172 of 193 countries in the world have rising life expectancy

Average for countries with	1990	2014
Minimal life expectancy	36	48
Medium life expectancy	68	72
Maximal life expectancy	79	83

The Bad News

The gap in risk experience between rich and poor countries and between rich and poor people is increasing

Number of death between

16 and 60 per 10,000 (females)	1990	2014
Low income countries	4670	5740
Medium income	1480	1190
High income	410	400

The Top Killers in the World

High income countries: smoking, drinking, unbalanced nutrition, lack of exercise (around 60% of all premature death)

Medium income countries; unbalanced nutrition, infections (including HIV), occupational health and safety, smoking, accidents, homicide

Low income countries. Infections (TBC, Malaria, HIV), diarrheal disease (unclean water), malnutrition, occupational health and safety

Safety: Important Statistical Insights

- Globally 2.3 million die due to work-related risks, more than those caused by war, malaria, traffic, earthquakes and other natural risks. The biggest killers cardiovascular diseases and cancer have a substantial component caused by work-related risks. ILO has estimated that globally 4% of the GDP is lost due to these risks
- *Worldwide, an estimated 1.2 million people are killed in road crashes each year and as many as 50 million are injured.*

Source: J. Takala 2014

In Contrast: Risks can be Managed

Occupational Safety

- Germany: 1960: 4.893 fatal accidents at work
- Germany 2013: 478 fatal accidents at work (80 Mio)
- Singapore 2013: 70 (5.5. Mio)
- In comparison Brazil: 12.239 (200 mio people)

Traffic Accidents

Germany: 1972: 20.895 fatal car accidents

Germany: 2013: 3.339

(Nigeria: 34 per 100,000; Germany 4; Singapore 2.8)

Conventional Risk: Conclusions

Those countries who have heavily invested in health services and safety could reduce the risk of premature death over the last 50 years by more than 60%

Countries with a low GDP but also those with a dramatically increasing GDP have on average improved life expectancy in fighting fatal diseases but have been less successful in providing safety and security , yet there are significant differences

Key variable is even access to health and safety services

Special Challenge: Systemic Risks

- Characteristics
 - Global threat (ubiquity)
 - Highly interconnected
 - Stochastic (second order uncertainty)
 - Non-linearity
- Problems
 - Limits of quantification
 - Plurality of knowledge claims and assessments
 - Contra-intuitive implications
 - Inadequacy of trial and error learning mode
 - Bad record for risk reduction everywhere

Three Major Systemic Risk Challenges

- *The intensity of human interventions into the natural environment*
- *The lack of adequate governance for designing and implementing collective actions*
- *The social side effects of modernization and globalization*

Human Interventions in Nature

- *Significant human influence on global geophysical cycles (Carbon, ...)*
- *Exceeding sink capacity for absorbing human induced waste (pollution)*
- *Land-use patterns that endanger biodiversity and sustainable living conditions*

Governance Deficits

- *Inability to deal prudently with (global) common resources (climate, biodiversity)*
- *Optimizing efficiency in partial markets over resilience and fairness*
- *Sustaining corrupt and ineffective governance systems*
- *Failure to resolve conflicts by peaceful means*

Modernization Side-effects

- *Increasing gap between rich and poor: individually as well as collectively (richer is safer)*
- *High vulnerability to IT dependent systems (interconnectiveness)*
- *Loss of cultural identity and trust in the future*

Role of Innovations

- *Technical innovations are as much the problem as they are the solution (ambivalence of technology)*
- *Sustainability in risk management will depend on a balance between technological innovations, adaptive management, effective governance and behavioral adaptations*
- *The direction of future development will largely depend on the cooperation of governments, the private sector, expert communities and civil society*

The Five Promethian Breakthroughs

- *Invention of fire*
- *Neolithic revolution (agriculture)*
- *Industrialization with coal and other fossil fuels*
- *Mass production (Taylorism)*
- *Information Technology (Virtualization of services and communication)*

The Ongoing Fifth Transformation

- *Ecology: decarbonized, dematerialized, renaturalized (from coal to solar)*
- *Economy: smart structures, global communication and service providers*
- *Governance: less emphasis on nation state; multi-lateral arrangements, more deliberative participation*
- *Downside: security threats, inequality, protection of privacy, loss of identity)*

What Can We Do?

- *Embrace the fifth transformation but it needs accountable and responsible designers*
- *New governance strategies combining effectiveness (experts), efficiency (corporate sector), resilience (governments) and fairness (NGOs) to achieve legitimacy*
- *Inclusion of more direct citizen involvement in developing smart and sustainable lifeworlds*
- *More effective educational programs that make people understand their opportunities and risks and prepare them for their role in the new information age*

Quote:

Sustainability is often misunderstood. It does not mean securing what we have. The focus is not on conservation but on innovation and development. The world needs change, yet this change must obey a different rationale, i.e., the paradigm of justice with respect to the present and the future generations...

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Thank you for your attention



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