## Alcohol and global health

1.   GLOBAL RISKS AND CHRONIC DISEASES

In recent years, the World Economic Forum has published its global risk landscape, an assessment of the likelihood and severity of risks facing the world (World Economic Forum 2010). Figure 1, taken from the 2010 report, shows that chronic diseases (box 31) are in the top of the right of the global risk landscape, high in terms of both likelihood and severity.

Source: World Economic Forum 2010
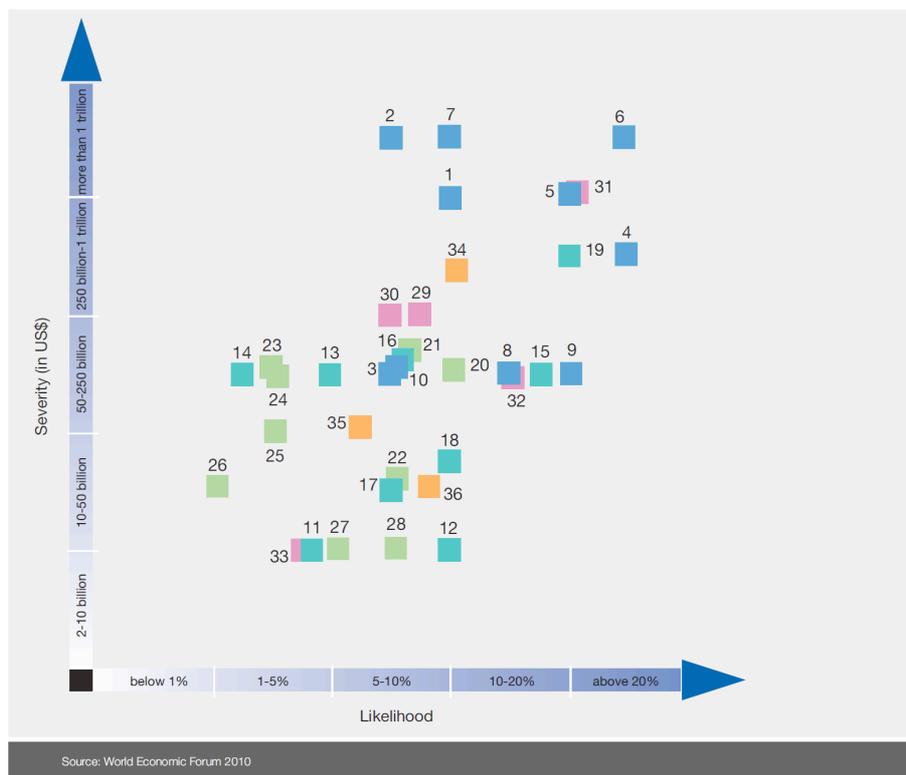
Economic Risks
1   Food price volatility
2   Oil price spikes
3   Major Fall in the US $
4   Slowing Chinese economy (<6%)
5   Fiscal crises
6   Asset price collapse
7   Retrenchment from globalization (developed)
8   Retrenchment from globalization (emerging)
9   Burden of regulation
10 Underinvestment in infrastructure

Geopolitical Risks
11 International terrorism
12 Nuclear proliferation
13 Iran
14 North Korea
15 Afghanistan instability
16 Transnational crime and corruption
17 Israel-Palestine
18 Iraq
19 Global governance gaps

Environmental Risks
20 Extreme weather
21 Droughts and desertification
22 Water scarcity
23 NatCat: Cyclone
24 NatCat: Earthquake
25 NatCat: Inland flooding
26 NatCat: Coastal flooding
27 Air pollution
28 Biodiversity loss

Societal Risks
29 Pandemic
30 Infectious diseases
31 Chronic diseases
32 Liability regimes
33 Migration

Technological Risks
34 Critical information infrastructure (CII) breakdown
35 Nanoparticle toxicity
36 Data fraud/loss

Figure 1 Global Risks Landscape 2010: Likelihood with Severity by economic loss. World Economic Forum, 2010.

Because the failures and risks of chronic diseases emerge over a long period of time, their enormous impact and long-term implications are vastly underestimated. Chronic diseases present a high and increasing threat and likely risk of severe global economic loss, threatening global well-being and dampening world development. One-half of those who die from chronic diseases are in their productive years and so the social costs and economic consequences in terms of lost productivity are considerable. Of the two most populous countries in the world, it is estimated that (in international dollars) China will forego $558 billion and India $237 billion in national income between 2005-2015 as a result of premature deaths caused by heart disease, stroke and diabetes alone (World Health Organization 2005). Brazil, Russia, India and China currently lose more than 20 million productive life-years annually to chronic diseases, and that number is expected to grow 65% by 2030.

As Figure 2 shows, chronic diseases are highly interconnected with other risks contributing to higher levels of systemic risk facing the world. Chronic diseases and poor mental health reduce resilience and the capacity to cope with the world's stresses, and their financial burden crowds out essential monies to deal with other global risks and systemic failures. Thus, there is a greater need for an integrated and more systemic approach to risk management.
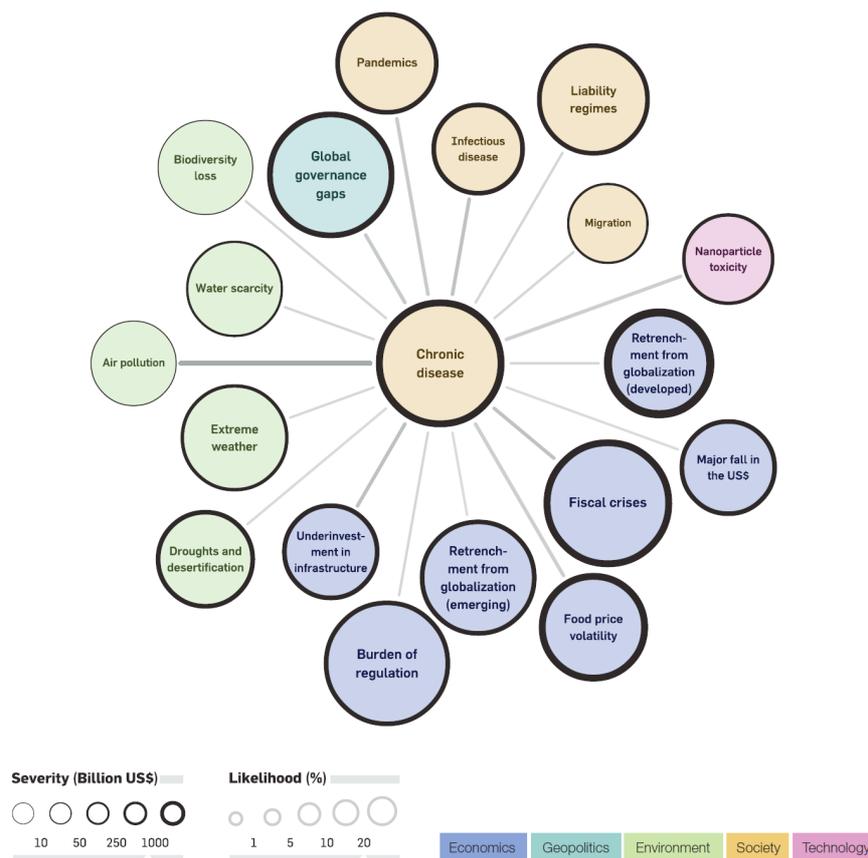
Figure 2 Chronic diseases and interconnected links.
Source: Global Risks 2010. World Economic Forum, 2010.

2.   ALCOHOL'S ROLE IN CHRONIC DISEASES

Table 1, taken from the World Health Organization's 2009 global health risks report, shows that globally, in 2004, alcohol was the third most important risk factor for disability adjusted life years, a measure of ill-health and premature death, after childhood underweight and unsafe sex. Alcohol ranked 8th in low income countries, 1st in middle income countries and 2nd in high income countries. In subsequent analyses, alcohol may jump to be the second most important risk factor, given alcohol's casual role in some of the negative outcomes of unsafe sex (Rehm et al 2009), which are not included in the 2004 estimates. Thus, globally, it could be considered that alcohol is the most important risk factor for adult chronic diseases.

Table 1 Ten leading risk factor causes of DALYs by income group, 2004.

	Risk factor	DALYs (millions)	Percentage of total		Risk factor	DALYs (millions)	Percentage of total
	World				*Low-income countries[a]*		
1	Childhood underweight	91	5.9	1	Childhood underweight	82	9.9
2	Unsafe sex	70	4.6	2	Unsafe water, sanitation, hygiene	53	6.3
3	Alcohol use	69	4.5	3	Unsafe sex	52	6.2
4	Unsafe water, sanitation, hygiene	64	4.2	4	Suboptimal breastfeeding	34	4.1
5	High blood pressure	57	3.7	5	Indoor smoke from solid fuels	33	4.0
6	Tobacco use	57	3.7	6	Vitamin A deficiency	20	2.4
7	Suboptimal breastfeeding	44	2.9	7	High blood pressure	18	2.2
8	High blood glucose	41	2.7	8	Alcohol use	18	2.1
9	Indoor smoke from solid fuels	41	2.7	9	High blood glucose	16	1.9
10	Overweight and obesity	36	2.3	10	Zinc deficiency	14	1.7
	Middle-income countries[a]				*High-income countries[a]*		
1	Alcohol use	44	7.6	1	Tobacco use	13	10.7
2	High blood pressure	31	5.4	2	Alcohol use	8	6.7
3	Tobacco use	31	5.4	3	Overweight and obesity	8	6.5
4	Overweight and obesity	21	3.6	4	High blood pressure	7	6.1
5	High blood glucose	20	3.4	5	High blood glucose	6	4.9
6	Unsafe sex	17	3.0	6	Physical inactivity	5	4.1
7	Physical inactivity	16	2.7	7	High cholesterol	4	3.4
8	High cholesterol	14	2.5	8	Illicit drugs	3	2.1
9	Occupational risks	14	2.3	9	Occupational risks	2	1.5
10	Unsafe water, sanitation, hygiene	11	2.0	10	Low fruit and vegetable intake	2	1.3

[a]   Countries grouped by 2004 gross national income per capita – low income (US$ 825 or less), high income (US$ 10 066 or more).

Table 1 concerns the number of new cases of diseases and injuries (incidence), and the number of individuals living with diseases or injuries and their sequelae (prevalence). These counts of incidence or prevalence of diseases in populations do not take into account the relative severity or health loss associated with different conditions, and hence do not capture the burden of disease experienced by individuals. Years lived with disability (YLD) is another summary measure, which measure the equivalent years of healthy life lost through time spent in states of less than full health. Table 2 shows that alcohol use disorders are the 4th most important cause of years lived

with disability among adults aged 15 years and over in low and middle income countries and the 3rd most important cause in high income countries (World Health Organization 2008).

**Table 2** Leading causes of years lived with disability, 2004.

Low- and middle-income countries			High-income countries		
Cause	YLD (millions)	Per cent of total YLD	Cause	YLD (millions)	Per cent of total YLD
1 Unipolar depressive disorders	55.3	10.4	1 Unipolar depressive disorders	10.0	14.6
2 Refractive errors	25.0	4.7	2 Hearing loss, adult onset	4.2	6.2
3 Hearing loss, adult onset	23.2	4.4	3 Alcohol use disorders	3.9	5.7
4 Alcohol use disorders	18.4	3.5	4 Alzheimer and other dementias	3.7	5.4
5 Cataracts	17.4	3.3	5 Osteoarthritis	2.8	4.1
6 Schizophrenia	14.8	2.8	6 Refractive errors	2.7	4.0
7 Birth asphyxia and birth trauma	12.9	2.4	7 COPD	2.4	3.5
8 Bipolar disorder	12.9	2.4	8 Diabetes mellitus	2.3	3.4
9 Osteoarthritis	12.8	2.4	9 Asthma	1.8	2.6
10 Iron-deficiency anaemia	12.6	2.4	10 Drug use disorders	1.7	2.4

COPD, chronic obstructive pulmonary disease.

3. ALCOHOL'S ROLE IN INDIVIDUAL HEALTH

Alcohol is an intoxicant affecting a wide range of structures and processes in the central nervous system, which, interacting with personality characteristics, associated behaviours and socio-cultural expectations, is a casual factor for intentional and unintentional injuries and harm to people other than the drinker, including reduced job performance and absenteeism, family deprivation, interpersonal violence, suicide, homicide, crime, and drink driving fatalities, and a contributory factor for risky sexual behaviour, sexually transmitted diseases and HIV infection (see Anderson et al 2009). Alcohol is a potent teratogen with a range of negative outcomes to the foetus, including low birth weight, cognitive deficiencies and foetal alcohol disorders (see Rehm et al 2009). Alcohol is neurotoxic to brain development, leading, in adolescence, to structural hippocampal changes, and, in middle age, to reduced brain volume. Alcohol is a dependence producing drug, similar to other substances under international control, through its reinforcing properties, and neuro-adaptation in the brain. Alcohol is an immunosuppressant, increasing the risk of communicable diseases, including tuberculosis. Alcoholic beverages are classified as carcinogenic by the International Agency for Research on Cancer, increasing the risk of cancers of the oral cavity and pharynx, oesophagus, stomach, colon, rectum and breast in a linear dose-response relationship, with acetaldehyde as a potential pathway. Alcohol has a bi-form relation with coronary heart disease. In low, and apparently regular doses (as little as 10g every other day), alcohol is cardio-protective, although doubt remains about the impact of confounders, and, at high doses, particularly when consumed in an irregular fashion, is cardio-toxic.

If you add up the risk of dying as an adult from an alcohol-related condition and plot this against the average amount of alcohol consumed per day or per week, you get a graph like that shown in Figure 3. This is data for an Australian population (Australian Guidelines 2009). Similar graphs are likely for other high income countries, although the nature of the slope will vary from population to population, depending on the drinking patterns and patterns of diseases. What this graph shows is that the lifetime risk of an alcohol-related death (including alcohol-related chronic diseases and alcohol-related injuries) increases linearly with the average volume consumed. It also shows that the risk increases even at tiny doses, such as 20g alcohol per week. It also shows that there are no differences in lifetime risk between men and women. This is due to the fact that at any given level of alcohol consumption, although women are more likely to die from an alcohol-related chronic condition, men are more likely to die form an alcohol-related injury. When both are added together, the differences between men and women are cancelled out. At 60g alcohol per day, the lifetime risk of dying from alcohol is 10% for both men and women. Below 20g alcohol per day, the lifetime risk is less than 1 in 100.
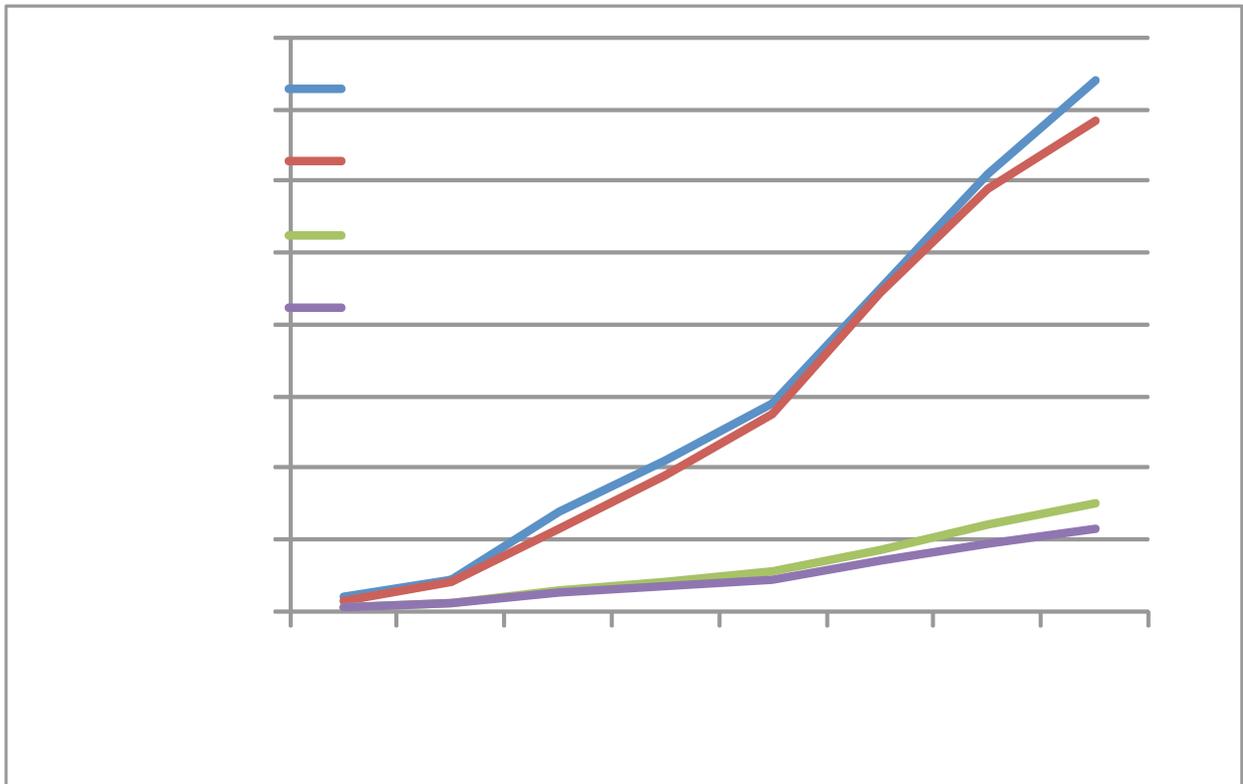
Figure 3 Lifetime risk of an alcohol-related death for Australian people by average alcohol consumption. Source: Australian guidelines (2009).

The Australian estimates were for alcohol-related conditions and did not take into account reduced risk from cardiovascular conditions. This has been done for the EURO-A and EURO-B countries[1], and the annual adult risk of death from alcohol-related chronic conditions, including the protective effect of alcohol on cardiovascular diseases) is shown in Figure 4. Essentially, above 10g/day, the lowest data point, the annual risk of death increases with increasing alcohol consumption in a linear fashion. There are little differences between men and women.
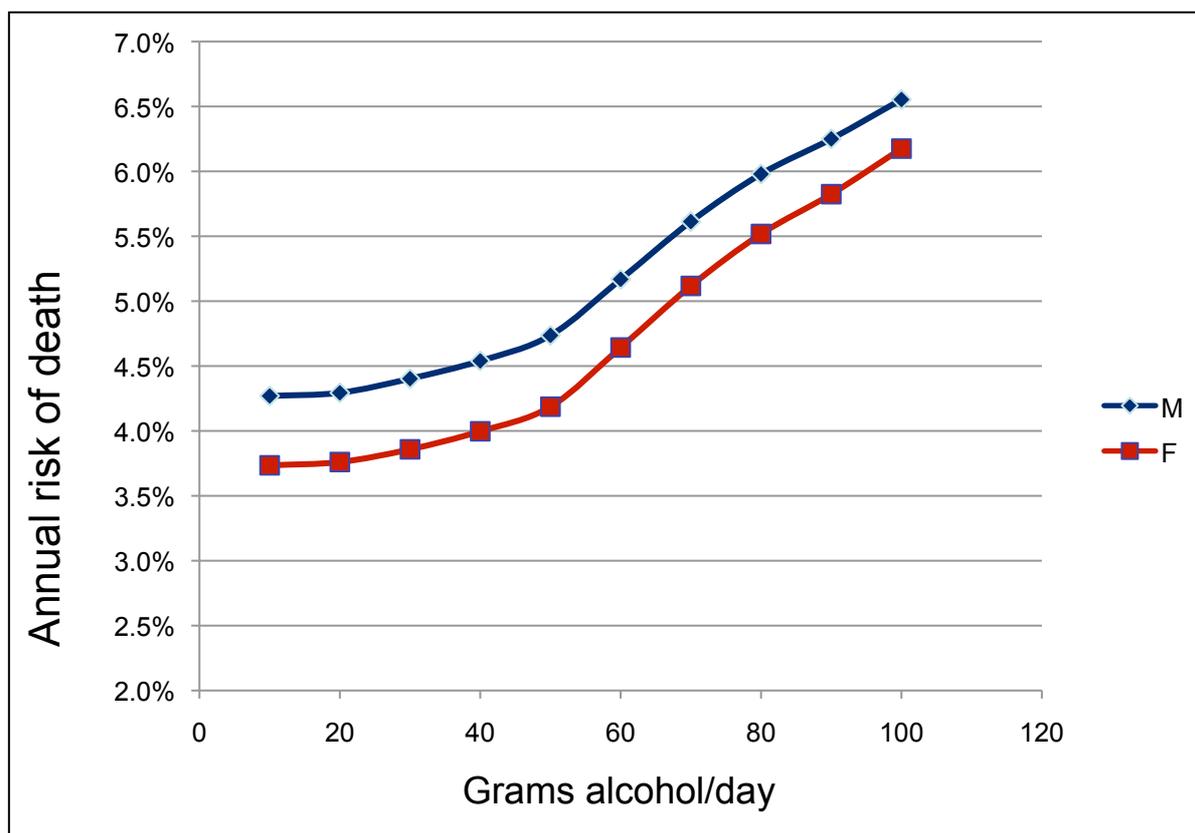
Figure 4 Annual risk of a chronic alcohol-related death, accounting for cardiovascular protection, for European people by average alcohol consumption. Source: Rehm et al (2010).

The similar graph, but this time for lifetime risk of death for alcohol-related injuries is shown in Figure 5. At any given level of alcohol consumption, the risk for men is much greater than the risk for women.

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[1] *Eur-A: very low adult/very low child mortality*
Andorra, Austria, Belgium, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Israel, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Portugal, San Marino, Slovenia, Spain, Sweden, Switzerland, United Kingdom.
Eur-B: low adult/low child mortality
Albania, Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Georgia, Kyrgyzstan, Montenegro, Poland, Romania, Serbia, Slovakia, Tajikistan, The former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Uzbekistan.
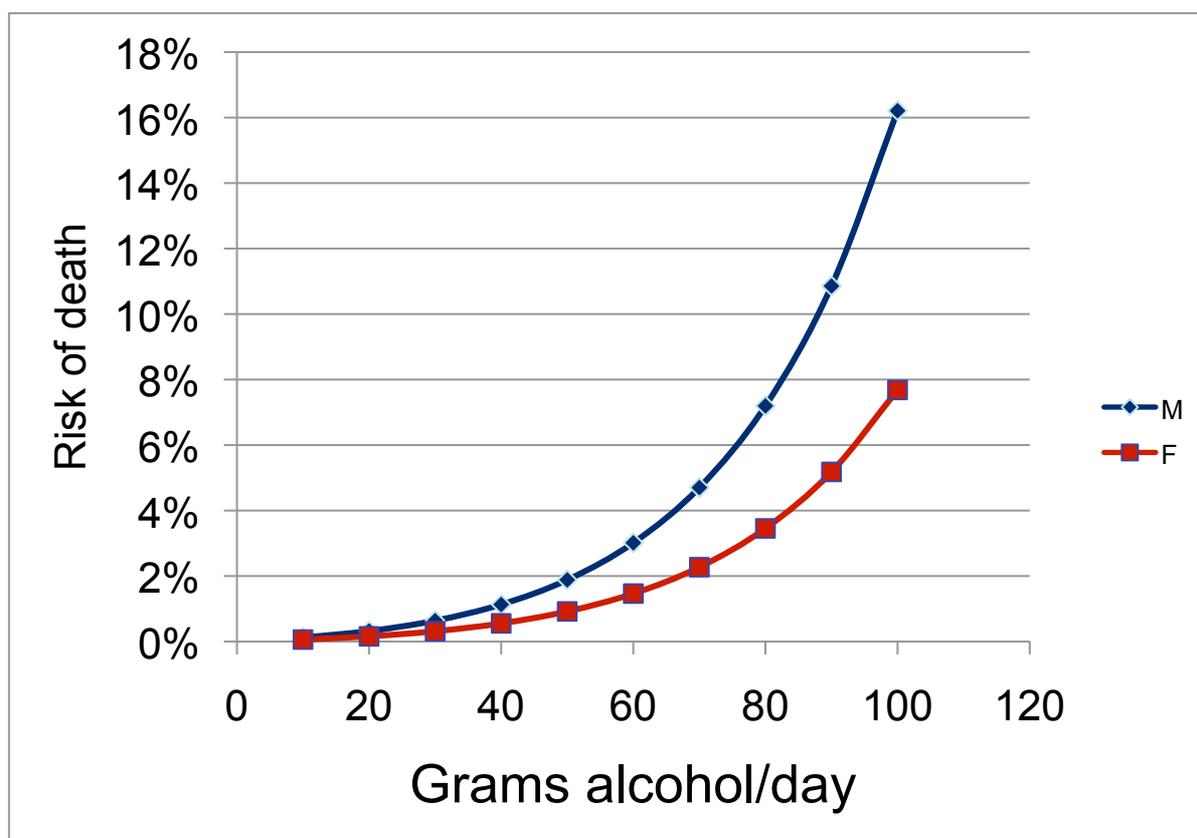
Figure 5 Lifetime risk of a alcohol-related injury death for European people by average alcohol consumption. Source: Rehm et al (2010).

4.   CONCLUSIONS

This fact sheet has highlighted three important things about alcohol and global health:

1. Chronic diseases are perceived as a highly important risk factor for the sustainability of the world and its future development;
2. Globally, alcohol is one of the most important risk factors for ill-health, premature death and chronic diseases; and
3. At the individual level, the risk of dying from an alcohol-related condition increases similarly for a man and a woman, such that, in high income countries, people who regularly consume 60g alcohol a day through their lives have a 10% chance of dying from an alcohol-related condition; even when accounting for alcohol's protective effect for cardiovascular diseases, certainly beyond 10g alcohol per day, the risk of death increases with increasing alcohol consumption.

From a policy perspective, this implies that the use of alcohol has to be accounted for when reducing the risks posed by chronic diseases; for alcohol, policies should provide incentives that allow individuals, and the environments in which they live, to take choices that favour less alcohol consumption. Fortunately, such evidence-based cost-effective policies exist (Anderson et al 2009; Anderson et al 2010; Babor et al 2010).

5.   REFERENCES

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