Available Hepatitis Information: how can this be used to convince decision makers and potential funders

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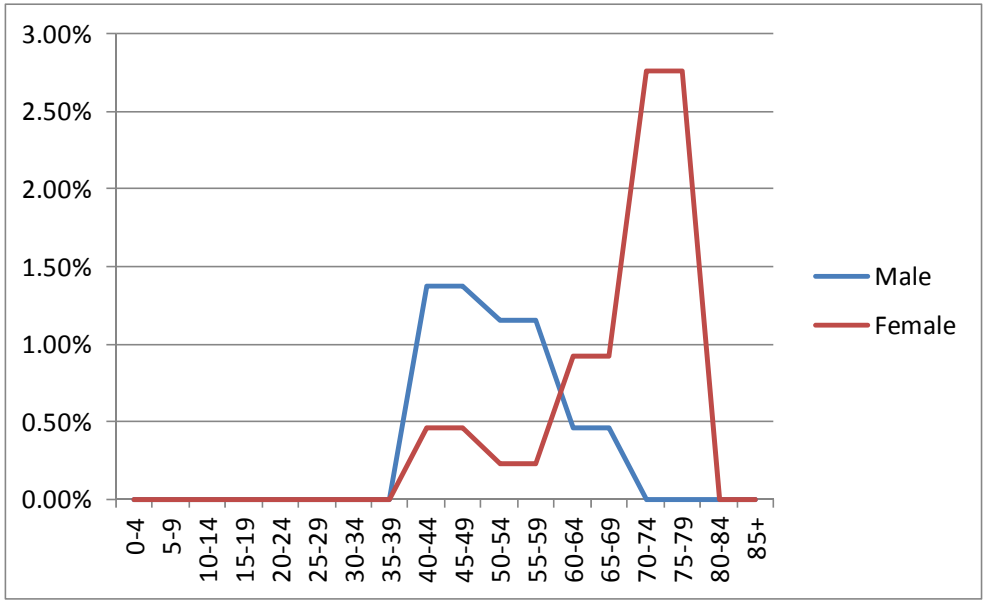
“It’s not what we don’t know that gives us trouble, it’s what we know that ain’t so”

Will Rogers

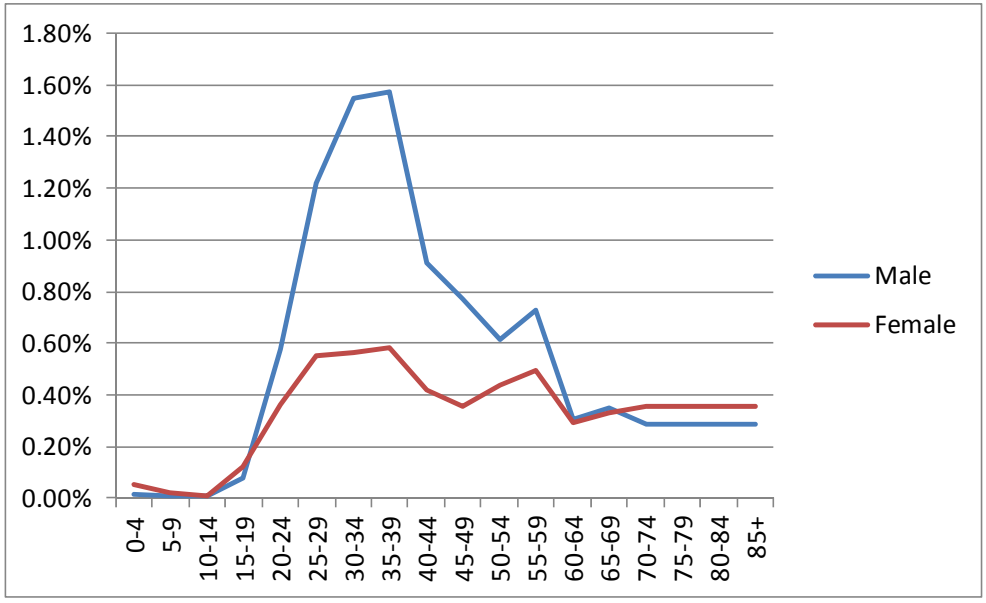
What is it that we know that ain't so:

- The total number of HCV infections, diagnosis rate and treatment rate is unknown.
- Development of a national strategy requires perfect information – e.g., a robust nation-wide surveillance study.
- The epidemiology data in developing countries is less robust than Western Europe and US.
- There are not enough healthcare providers to increase treatment.
- What we have learned from HIV can be directly applied to HCV.

German national survey vs notification data

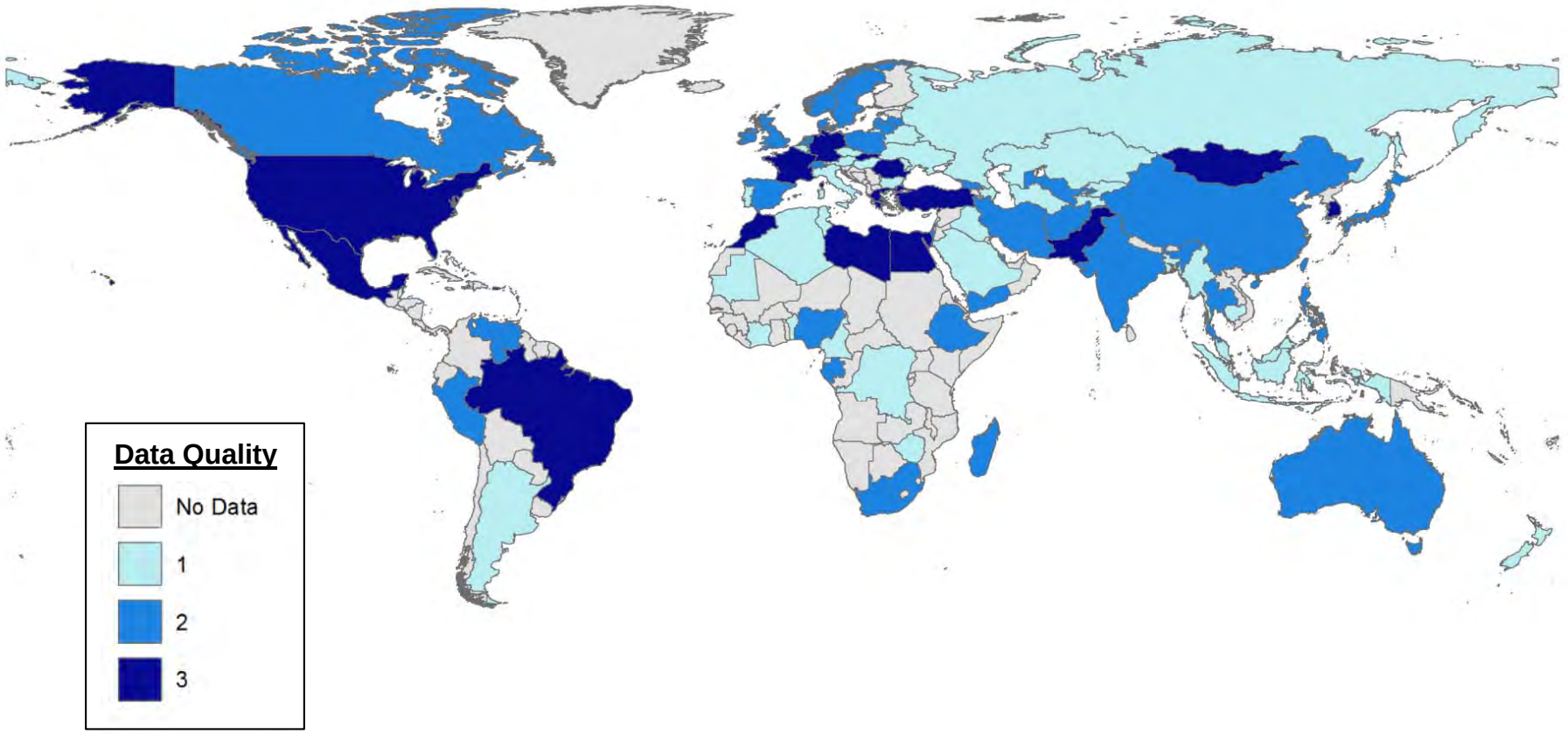


DEGS1 (n= 7,047 in adults 18-79)
(Poethko-Muller 2013)



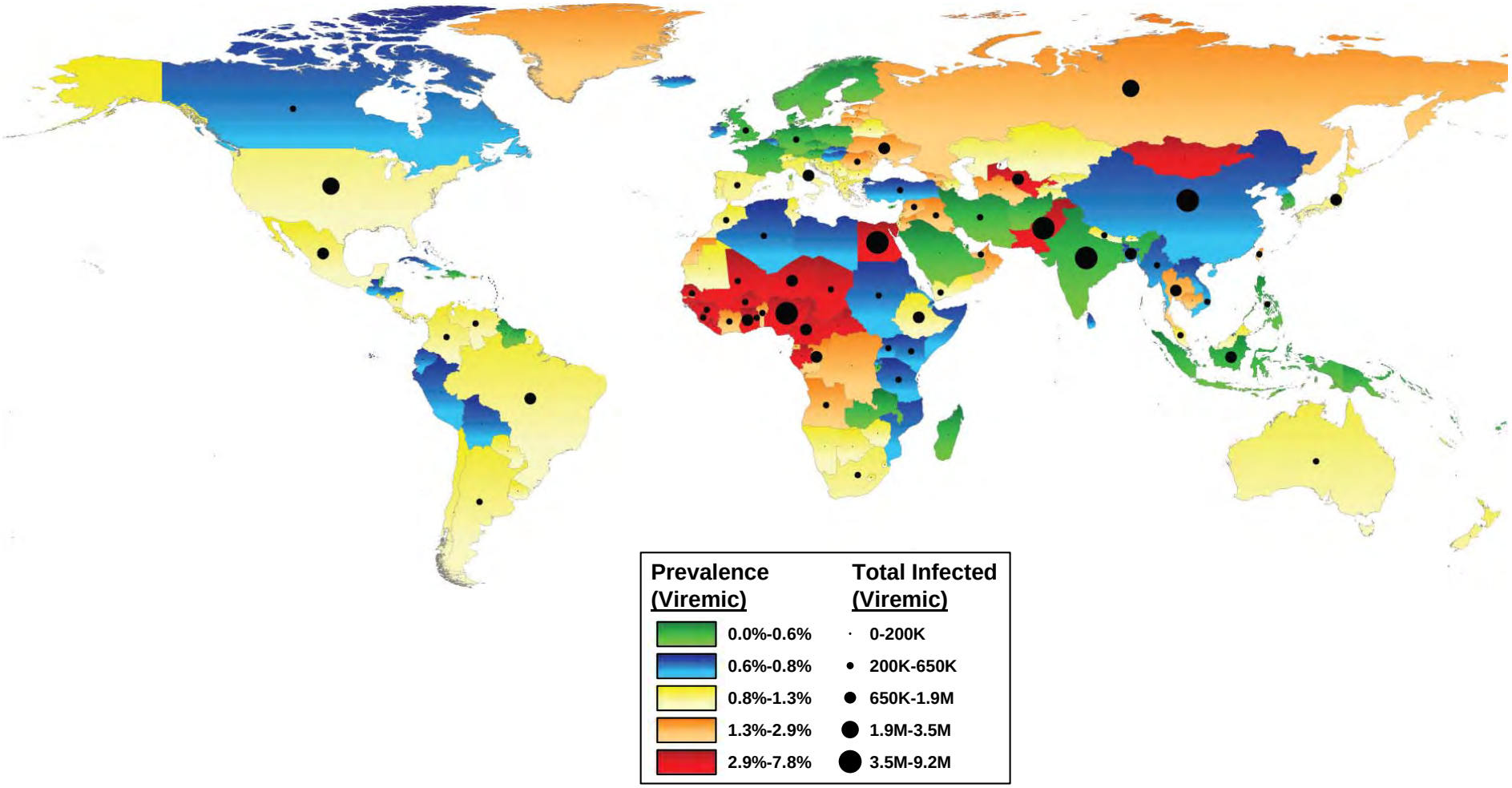
RKI notifications 2012 (n= 4,971)

Anti-HCV Prevalence – 88 countries have reported anti-HCV prevalence (88% of world's adult population and 85% of infections)



Gower, E., Estes C., Hindman, S., Razavi-Shearer, K., Razavi, H. Global epidemiology and genotype distribution of the hepatitis C virus. Journal of Hepatology 2014.

There are 80 (62-103) million viremic infections worldwide corresponding to a prevalence of 1.1% (0.9-1.4%)



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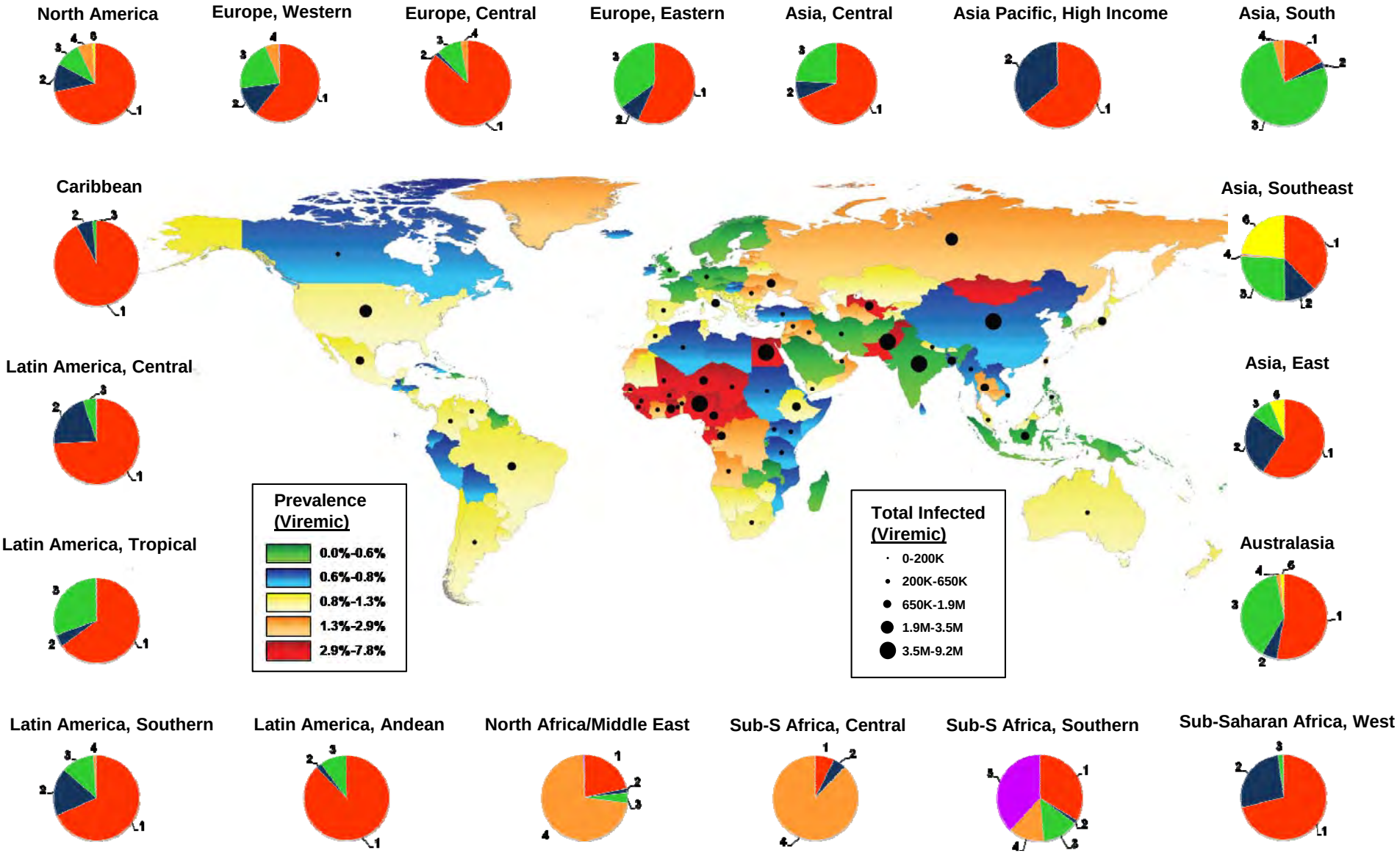
Genotype data is available for 99 countries



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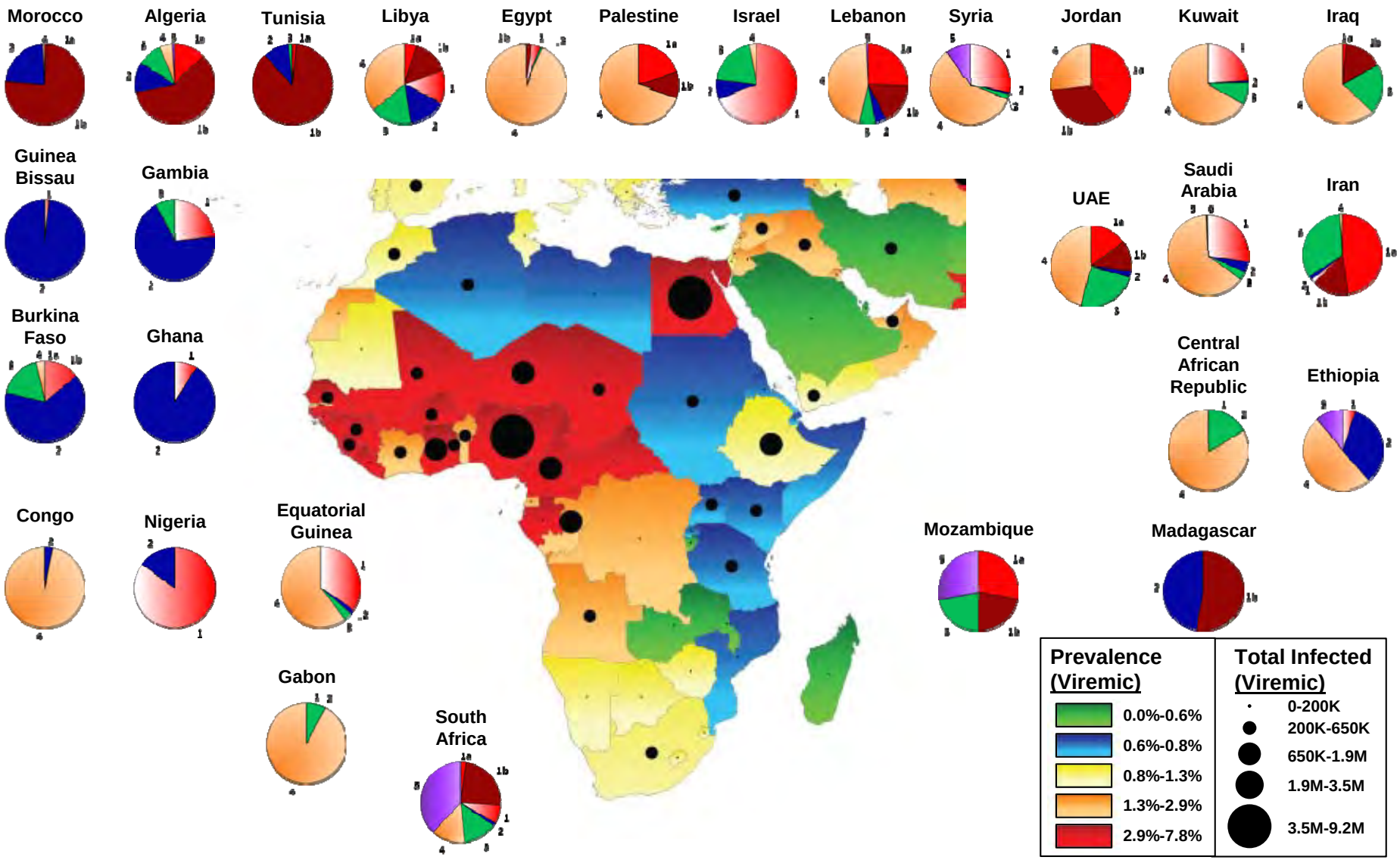
HCV Prevalence and Genotype Distribution
Africa & Middle East



Gower, E., Estes C., Hindman, S., Razavi-Shearer, K., Razavi, H. Global epidemiology and genotype distribution of the hepatitis C virus. Journal of Hepatology 2014.

The present and future HCV disease burden has been modeled for over sixty countries/ regions

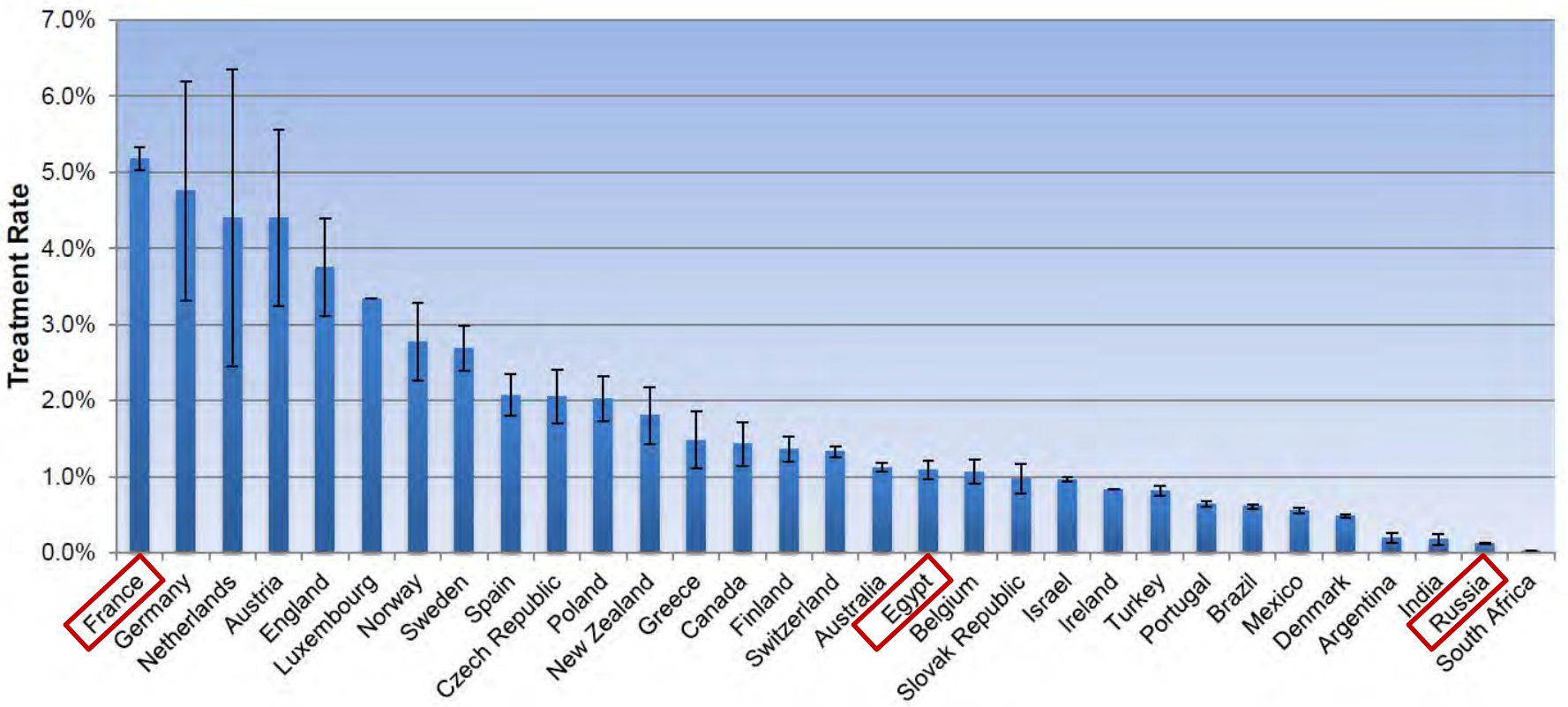
Argentina	European Union	Japan	Saudi Arabia
Australia	Finland	Latvia	Singapore**
Austria	France	Lebanon*	Slovakia
Belgium	Ghana**	Lithuania	Slovenia
Brazil	Georgia**	Luxembourg	South Africa
Bulgaria*	Germany	Malta	South Korea
Canada	Greece	Mexico	Spain
Chile**	Hong Kong**	Mongolia	Sweden
China**	Hungary	Netherlands	Switzerland
Colombia**	Iceland	New Zealand	Taiwan*
Croatia**	India	Norway	Turkey
Czech Republic	Indonesia*	Pakistan	UAE*
Denmark	Iran*	Poland	United States
Egypt	Ireland	Portugal	
England	Israel	Romania	
Estonia*	Italy	Russia	

* *Need validations with local experts*

A systematic process is used to develop consensus estimates of HCV disease burden in each country

- **Pre-Meeting 1**
  - » Conduct an exhaustive literature search for English and non-English published studies finding key inputs – HCV prevalence, age distribution, genotype, diagnosed, treated, incidence
  - » Pre-populate the disease burden model and send out a slide deck summarizing findings
- **Meeting 1 with local experts (3 hours)**
  - » Provide a brief overview of the methodology and model
  - » Review assumptions and identify data gaps
  - » Make modifications to key inputs based on expert input and unpublished data
  - » Identify action items with key responsibilities
- **Between Meetings 1 & 2**
  - » Work with stakeholders to gather additional data and re-calibrate the model
- **Meeting 2 with local experts (3 hours)**
  - » Review updated inputs and gain agreement
  - » Develop strategies to manage the HCV disease & cost burdens over the next 20 years
- **Post-Meeting 2**
  - » Develop manuscripts to be submitted to peer-reviewed journals
  - » Submit abstracts to conferences to present findings

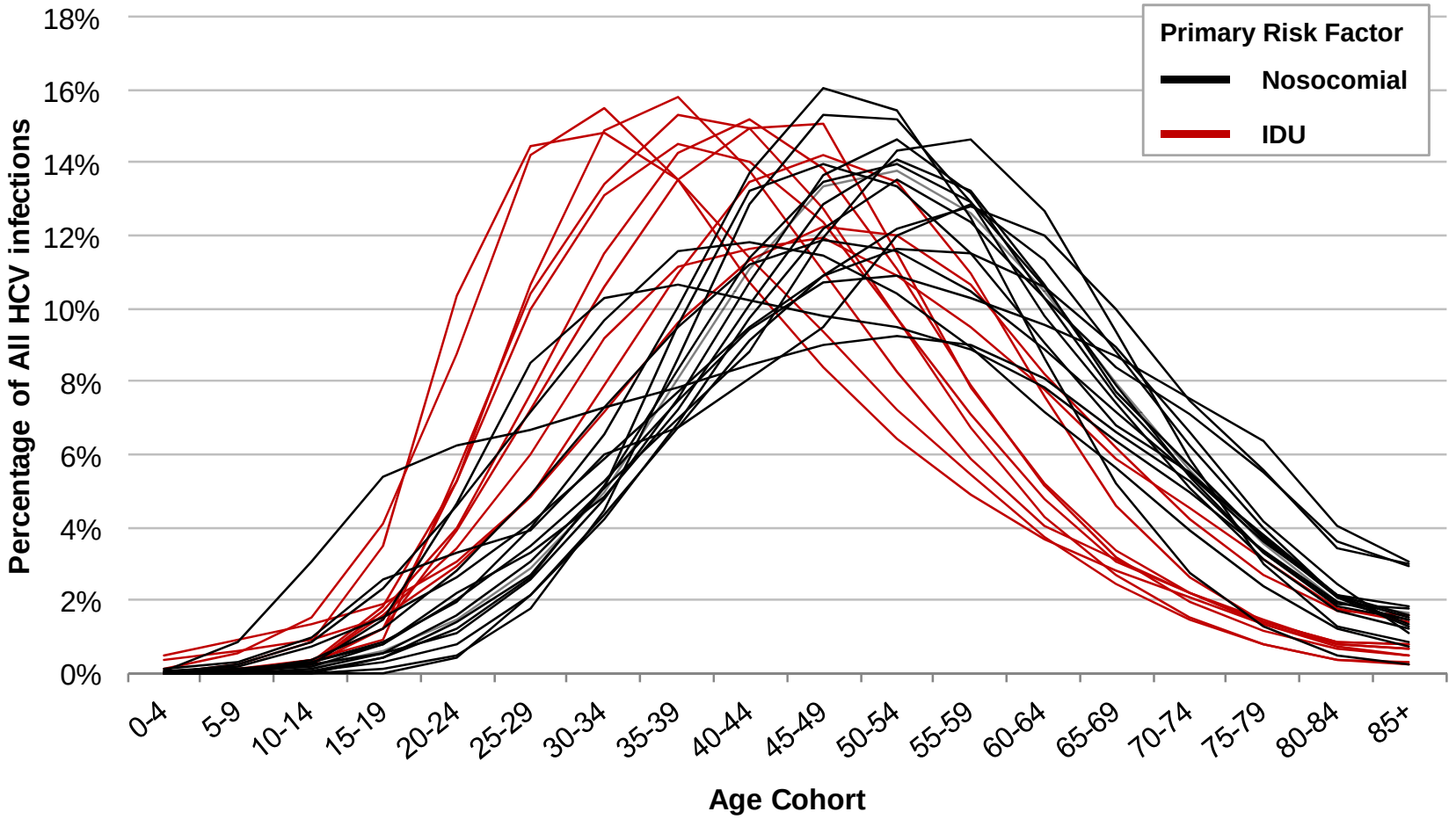
2011 Treatment rate is available for >50 countries



Razavi H, Waked I, Sarrazin C, Myers RP, Idilman R, Calinas F, et al. The present and future disease burden of hepatitis C virus (HCV) infection with today's treatment paradigm. J Viral Hepat 2014;21 Suppl 1:34-59.

Hatzakis A, Chulanov V, Gadano AC, Bergin C, Ben-Ari Z, Mossong J, et al. The present and future disease burden of hepatitis C virus (HCV) infection with today's treatment paradigm – J Viral Hepat 2014. Submitted for publication 30 July 2014.

Age distribution for >50 countries



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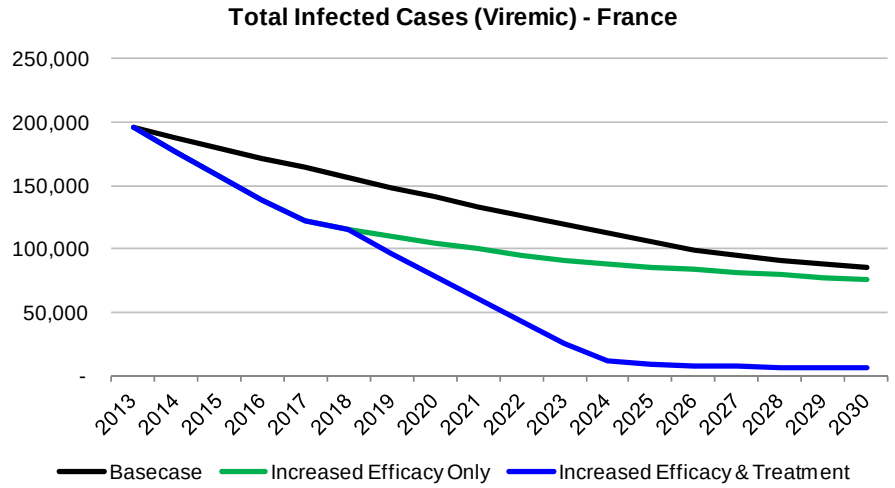
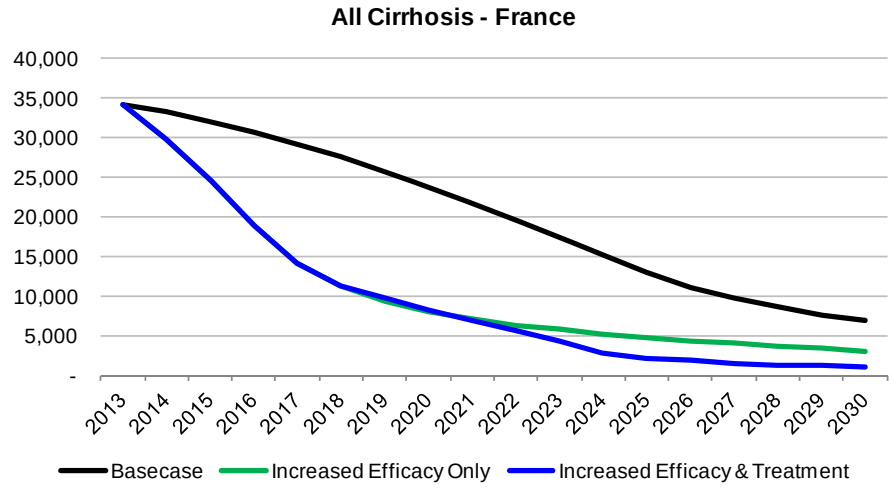
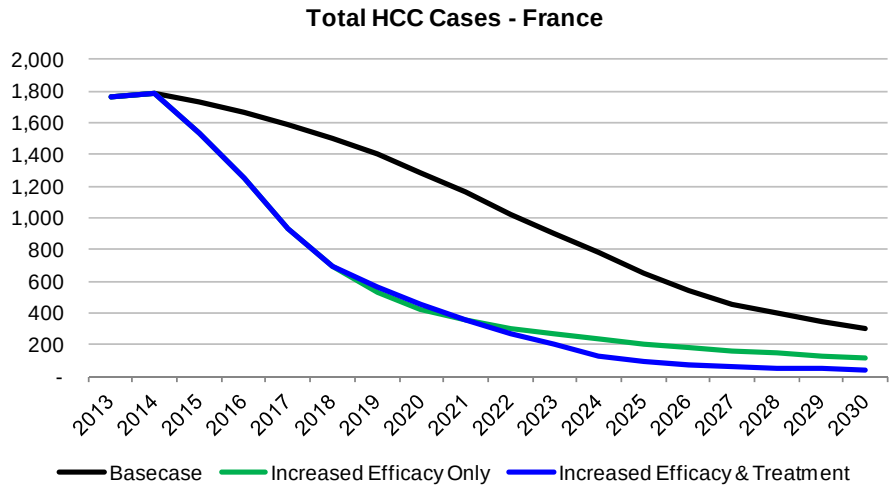
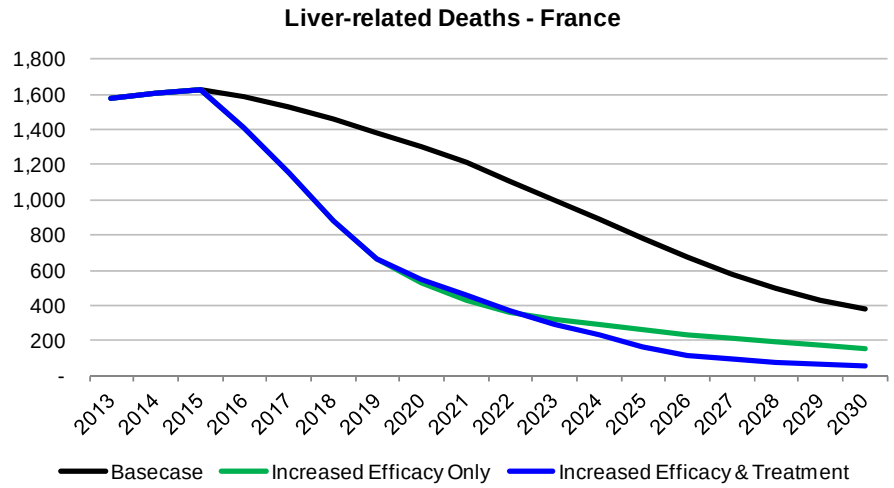
Change in disease burden and impact of different strategies - France



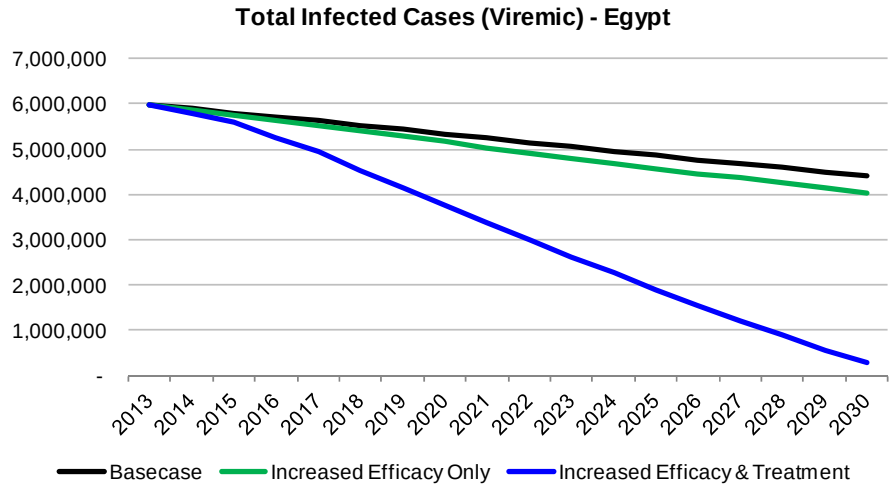


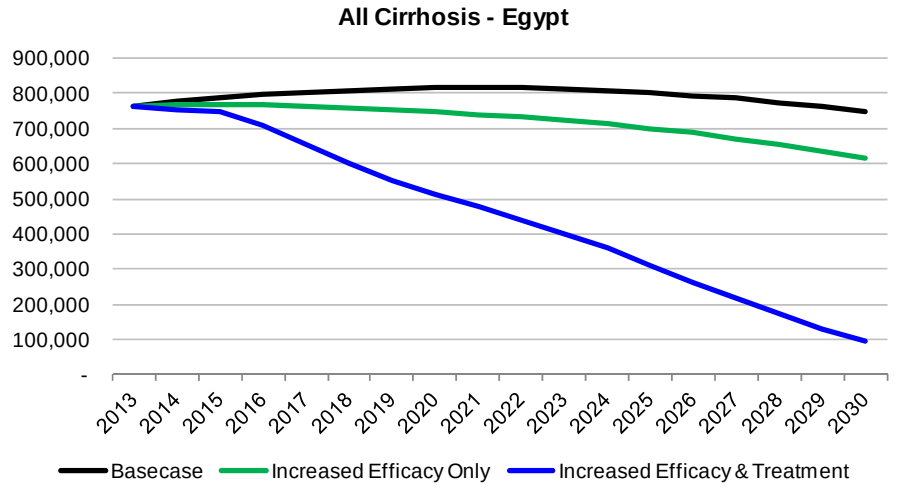


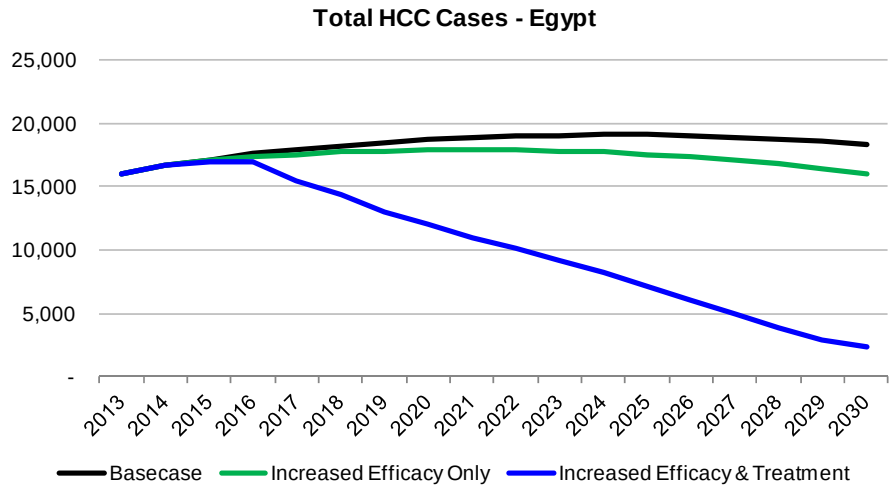


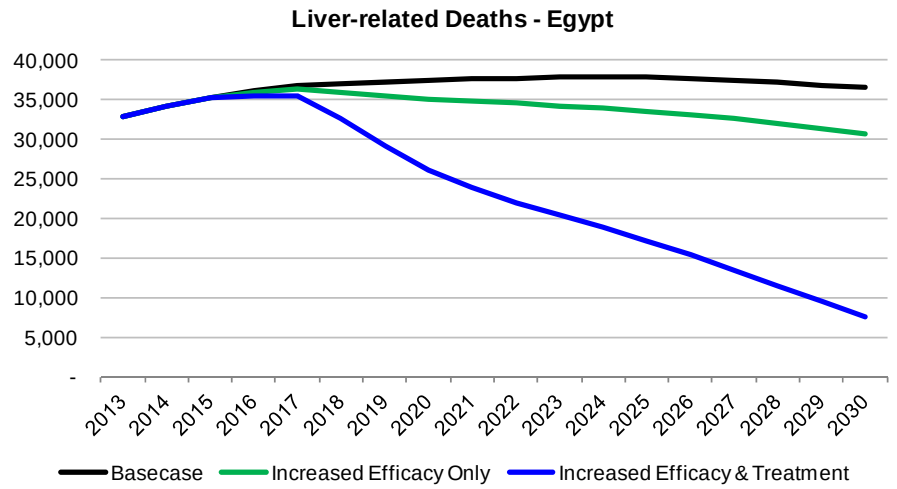
Wedemeyer H, Duberg AS, Buti M, Rosenberg WM, Frankova S, Esmat G, et al. Strategies to manage hepatitis C virus (HCV) disease burden. J Viral Hepat 2014 May;21 Suppl 1:60-89.

Change in disease burden and impact of different strategies - Egypt









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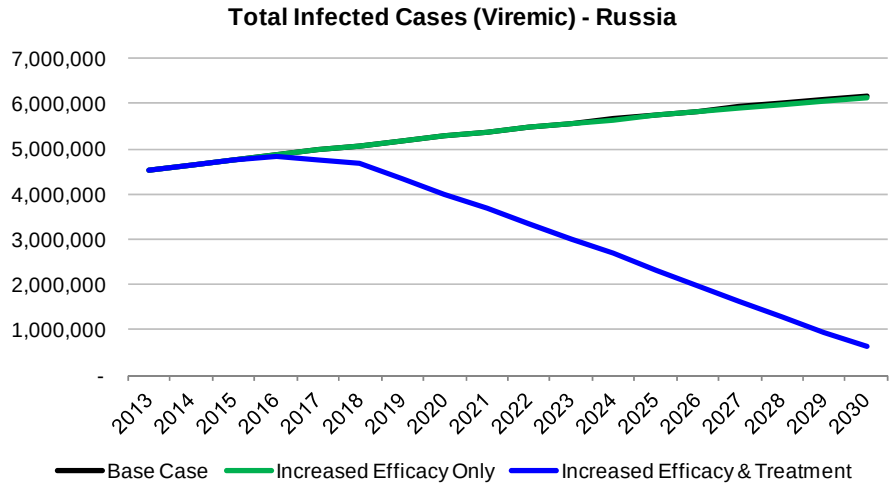
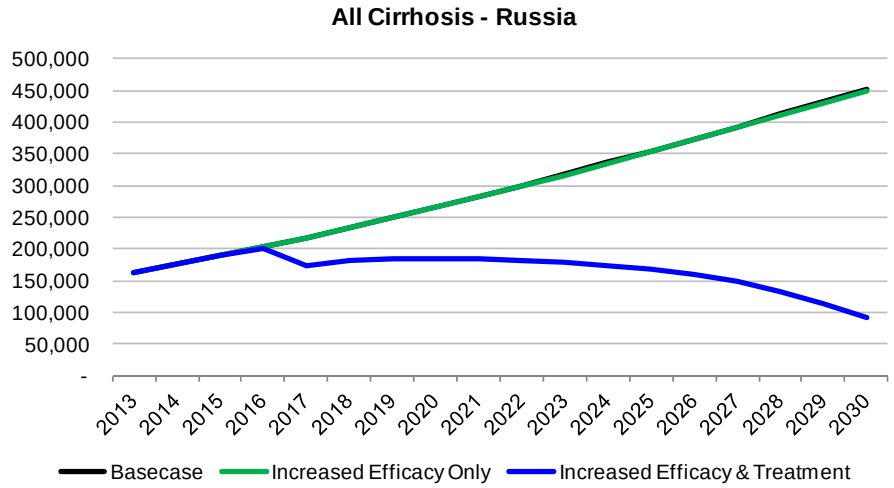
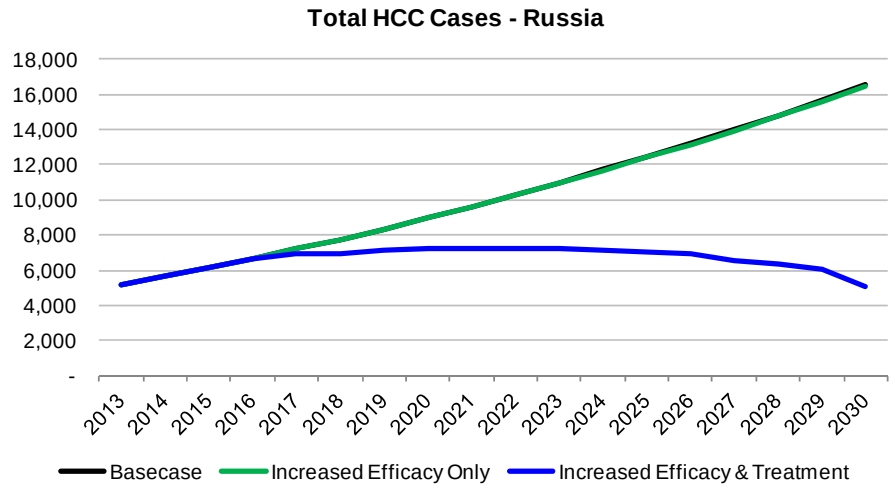
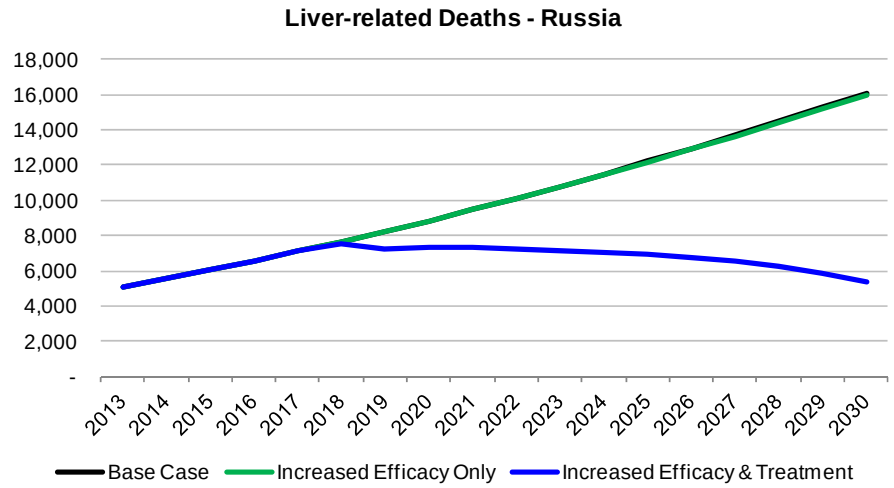
Change in disease burden and impact of different strategies - Russia



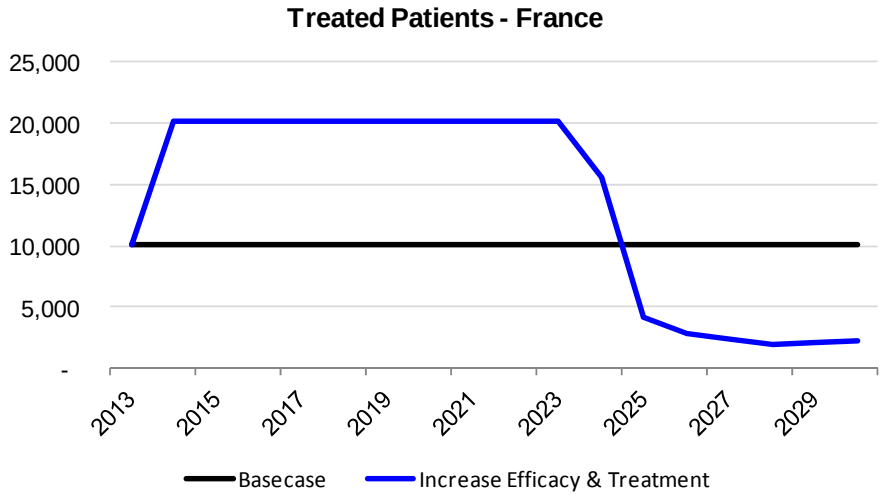


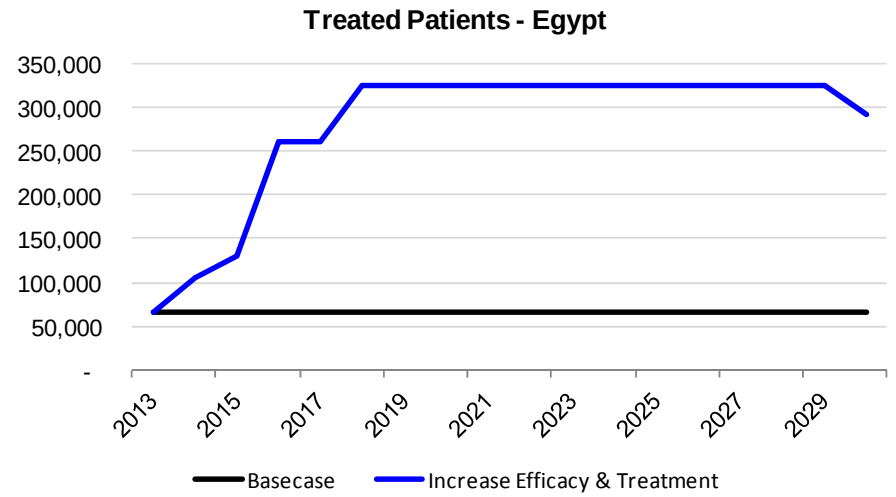




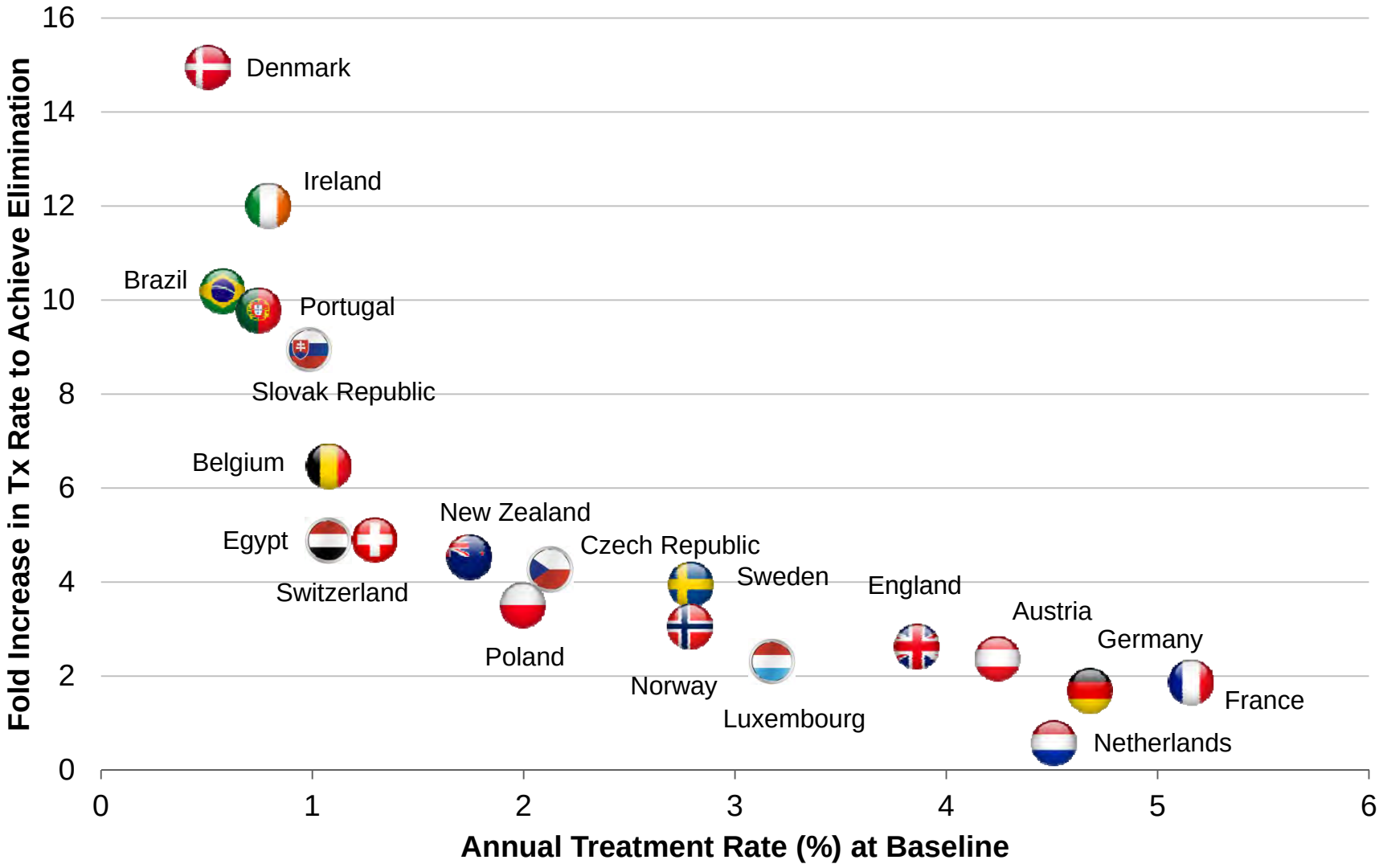
Gane E, Kershenobich D, Seguin-Devaux C, Kristian P, Aho I, Dalgard O, et al. Strategies to manage hepatitis C virus (HCV) infection disease burden - volume 2. J Viral Hepat 2015 Jan;22 Suppl 1:46-73.

There is a finite number of HCV cases to be treated





Fold increase in annual treatment rate required to achieve HCV >90% reduction in prevalence by 2030



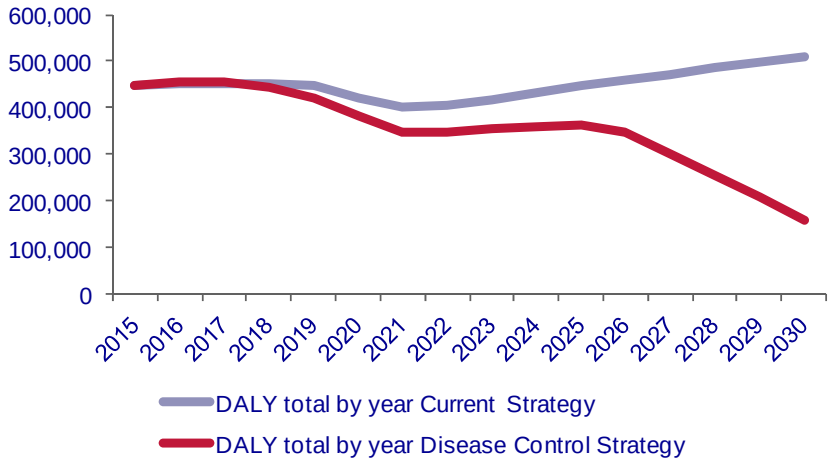
Cost of screening HCV-infected population by birth cohort – for countries with known diagnostic costs

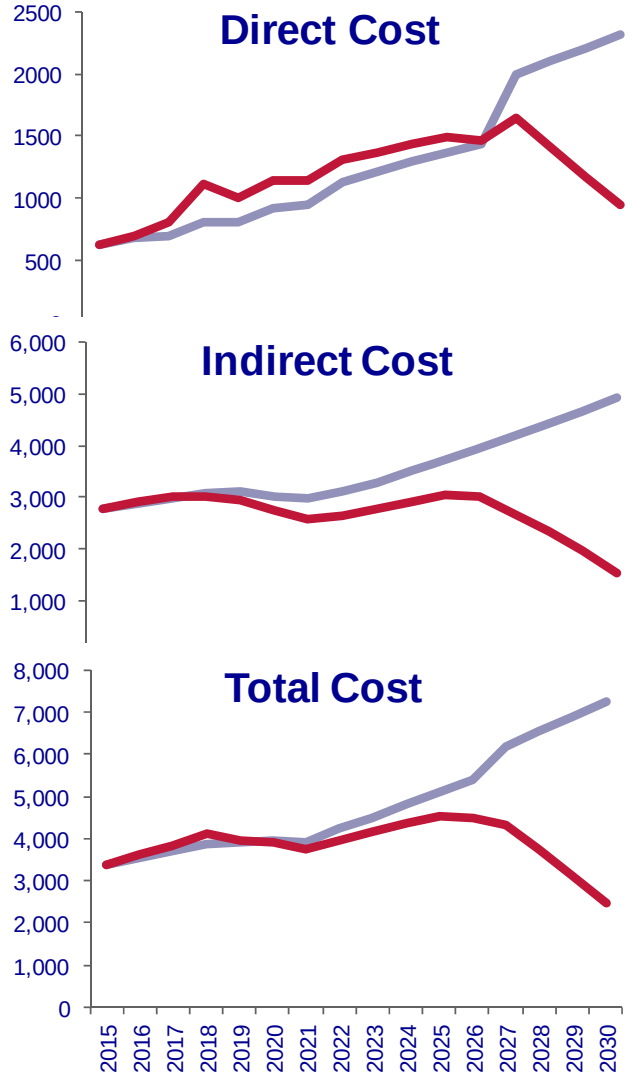
Example: Switzerland

	Birth Cohort			
	General (1924-2013)	**40-44 years (1969-1973)**	**50% of cases (1959-1978)**	**75% of cases (1949-1983)**
Prevalence and diagnosis rates				
Anti-HCV prevalence	1.3%	2.3%	2.2%	2.1%
HCV RNA prevalence	1.0%	1.8%	1.8%	1.6%
Diagnosis Rate	40%	40%	40%	40%
Number of tests required to identify 1 viremic case to treat (n)				
Anti-HCV	158	92	94	101
HCV RNA	1.3	1.3	1.3	1.3
Genotype	1	1	1	1
Associated costs to identify 1 viremic case, by test type (CHF)				
Anti-HCV	3,939	2,295	2,357	2,531
HCV RNA	226	226	226	226
Genotype	180	180	180	180
Total	**4,345**	**2,701**	**2,763**	**2,937**

Bruggmann P, Negro F, Bihl F, Blach S, Lavanchy D, Müllhaupt B, Razavi H, Semela D, Birth Cohort Distribution and Screening of Viremic HCV Infections in Switzerland AASLD/EASL 2014 Special Conference on Hepatitis C, 2014, New York

Direct and indirect cost of HCV with and without new treatment - Egypt





	Current Therapy	Disease Control Strategy
Cumulative DALYs 2015-2030	8.24 Mill	5.8 Mill
DALYs Averted vs Current Therapy	-	2.4 Mill
Cumulative Direct Costs 2015-2030 (US$)	25.5 Bln	20 Bln
Incremental cost (US$)	-	-5.5 Bln
ICER/DALY averted (US$)	-	-2,290
Cumulative Indirect Costs 2015-2030 (US$)	67.2 Bln	44.6 Bln
Incremental cost (US$)	-	-22.6 Bln
ICER/DALY averted (US$)	-	-9,350
Cumulative Total Costs 2015-2030 (US$)	92.7 Bln	64.6 Bln
Incremental cost (US$)	-	-28.1 Bln
ICER/DALY averted (US$)	-	-11,650

Estes, et al. Future Economic Burden of Hepatitis C in Egypt: Impact of Treatment Strategies. AASLD/EASL 2014 Special Conference on Hepatitis C, 2014, New York, abstract # 18

What is next?

- A global observatory for HCV, HBV and HDV
  - » Actual epidemiology and disease burden data
  - » Modeling for HBV
  - » Comparison against forecasts
  - » All open access