

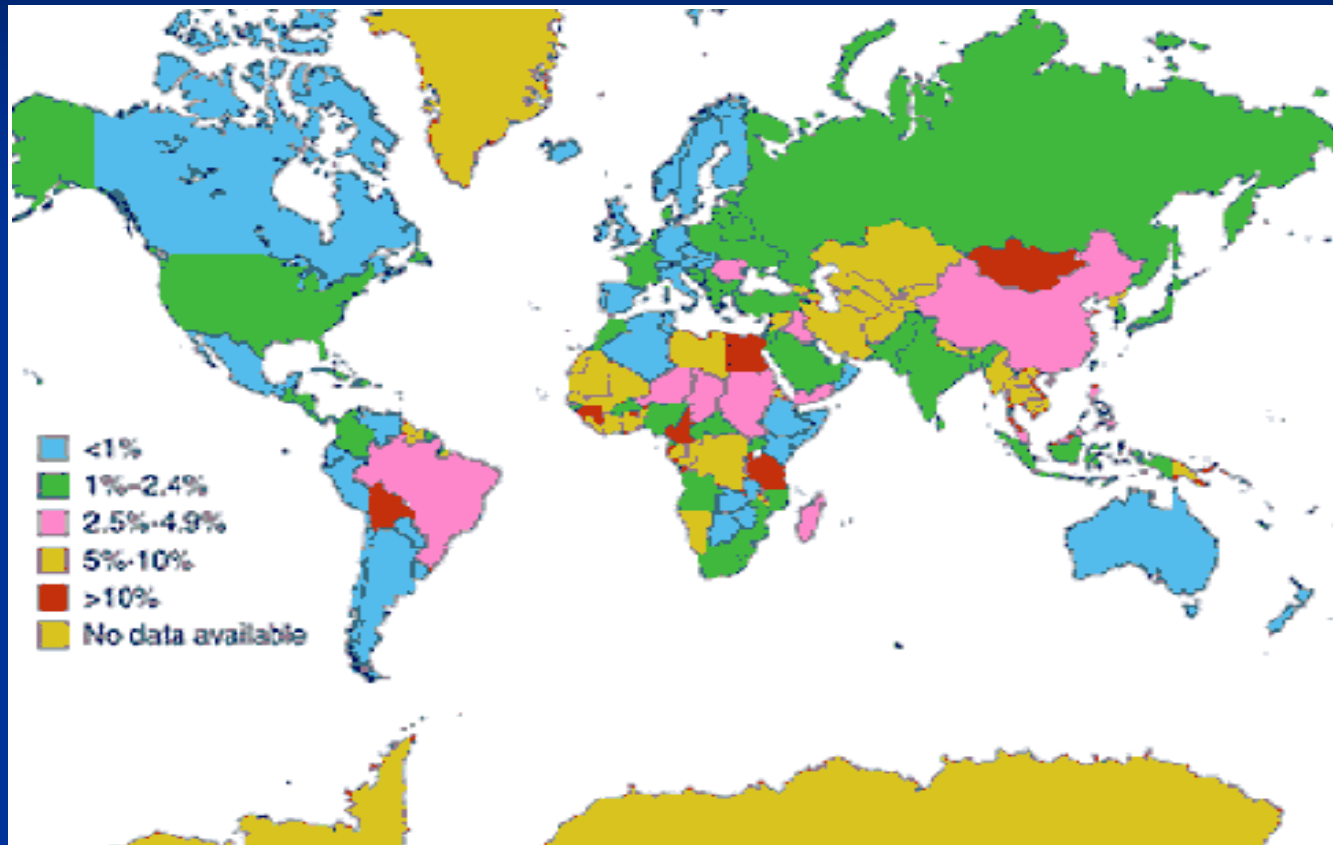
# **Hepatitis C: A revolution in our times!**

Jordan J Feld MD MPH

Toronto Western Hospital

Sandra Rotman Centre for Global Health

# HCV: A major global public health problem



- 130-170 million people infected
- No vaccine
- Leading indication for liver transplant

# Why are so many people infected?

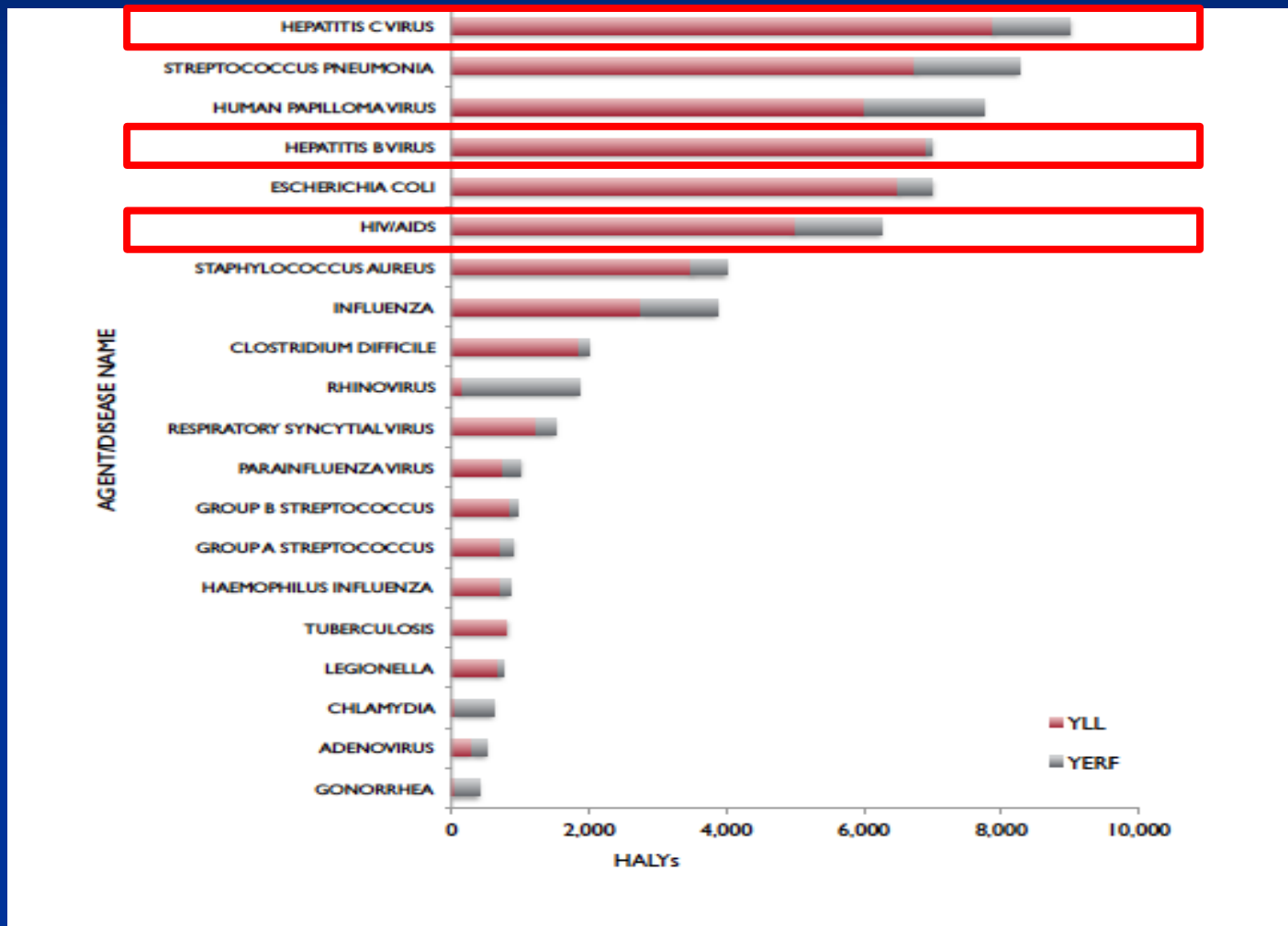
## ■ **Wealthy Countries**

- Injection drug use (even once)
- Tattoos
- Blood transfusions before 1992
- Cocaine use (blood on the straws)
- Sexual transmission – rare except MSM
- Mother to child – rare (~3-5%)
- Medical (rare but not never)

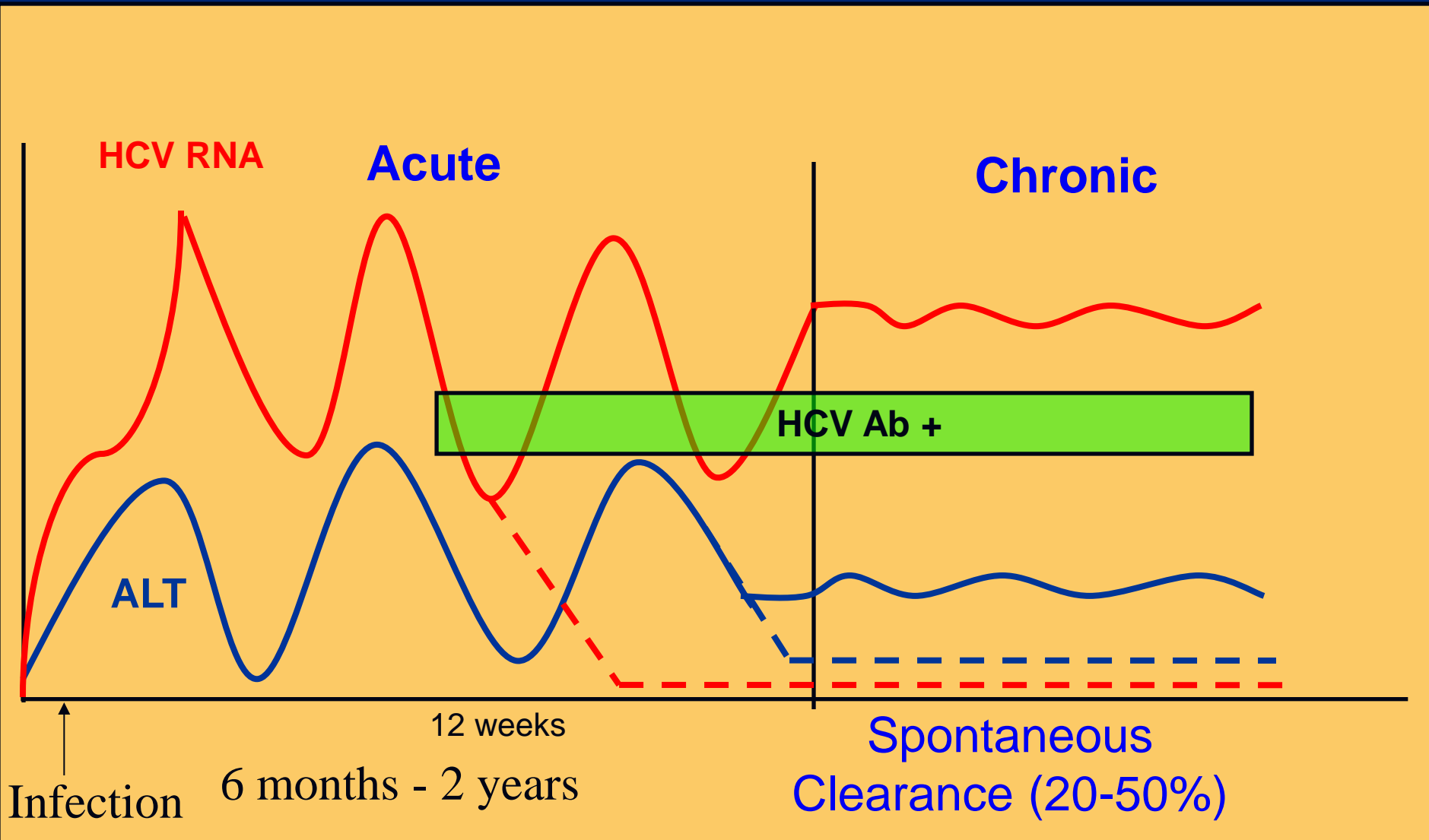
## ■ **Low/Middle Income Countries**

- Medical transmission
- All of the above

# HCV is a MAJOR health problem in Canada

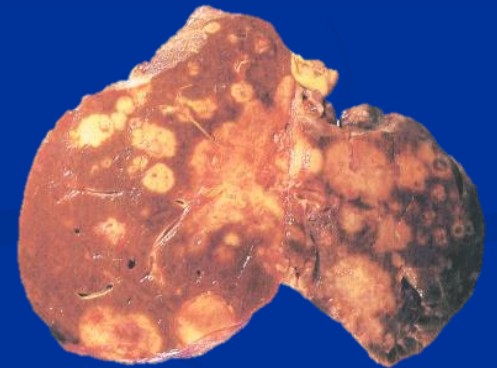


# Natural History



# Potential Consequences of HCV Infection

Healthy Liver → Cirrhosis → Liver Cancer  
20%  
(at 20 yrs of infection)  
1-4%/yr



Slowly progressive over decades of infection

Does this mean 80% do not have consequences?

**No!**

**Cirrhosis risk 41% at 30 yrs...lifetime risk 50-60% or higher**

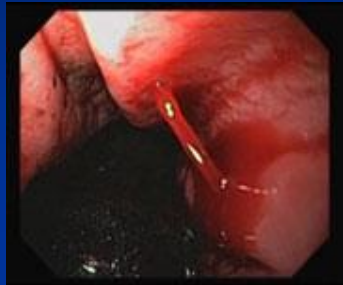
# Liver Disease Catches You By Surprise...



# What we're trying to prevent



Jaundice



Esophageal  
Varices



Cirrhosis



Fluid Retention  
Ascites



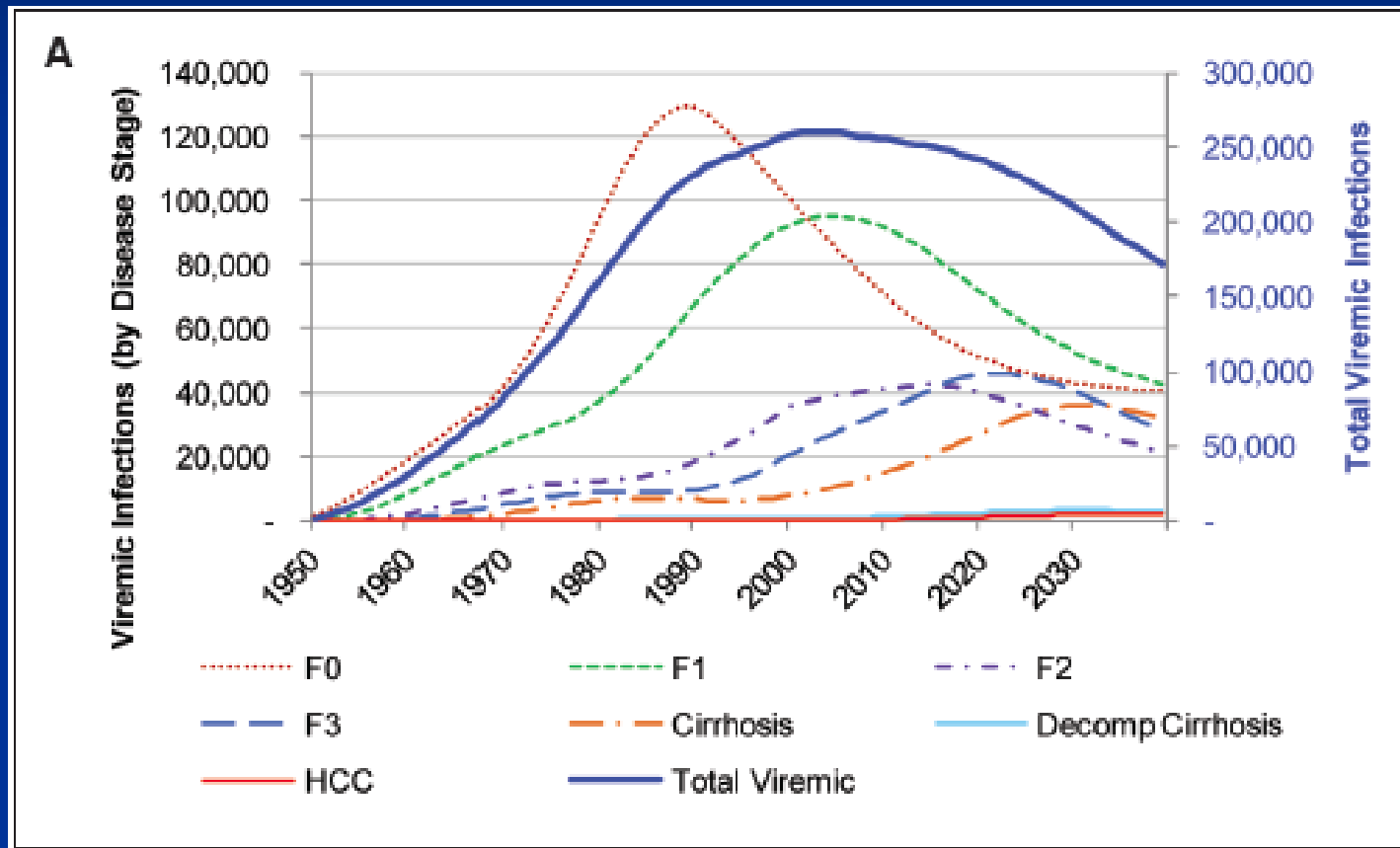
Liver Cancer



Hepatic  
Encephalopathy

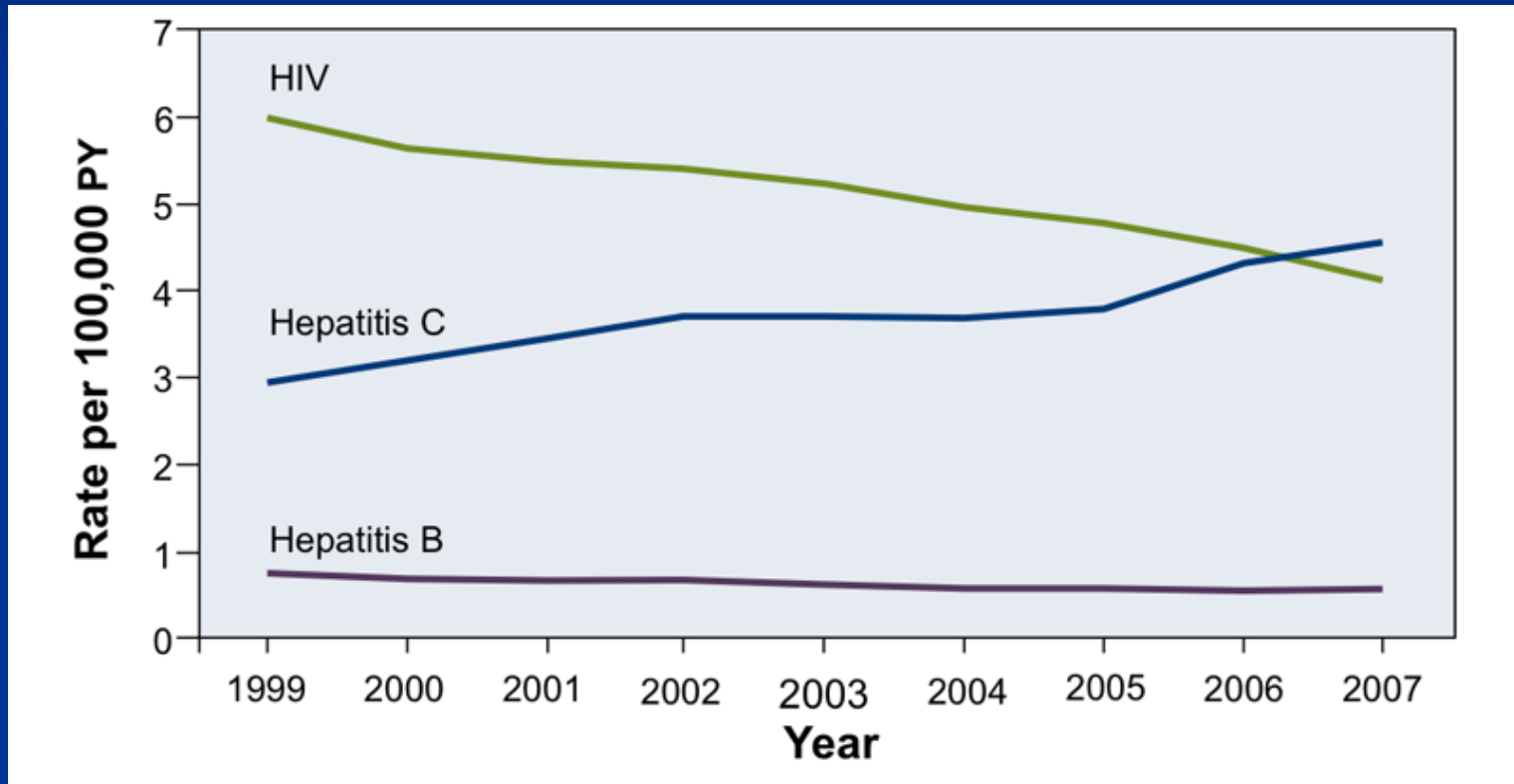


# The complications are just beginning

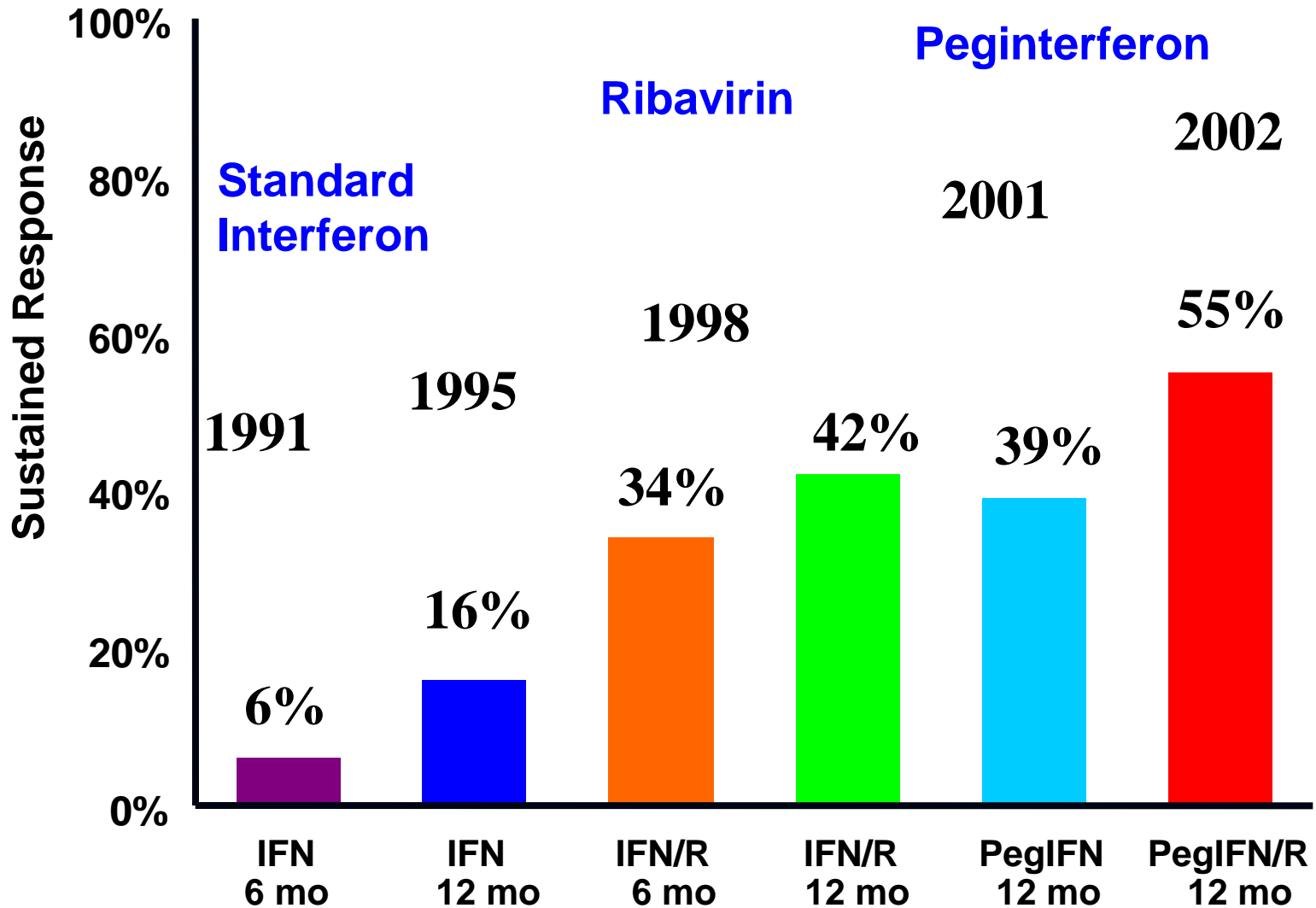


- Rising rates of cirrhosis, liver failure, liver cancer

# Increasing HCV and decreasing HIV mortality



# The Good News...

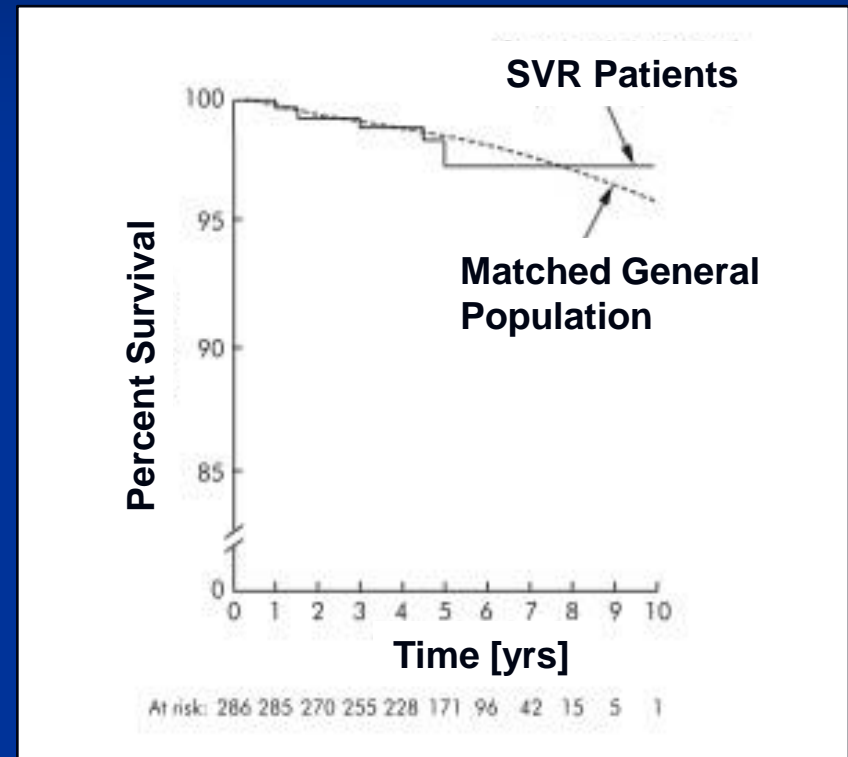
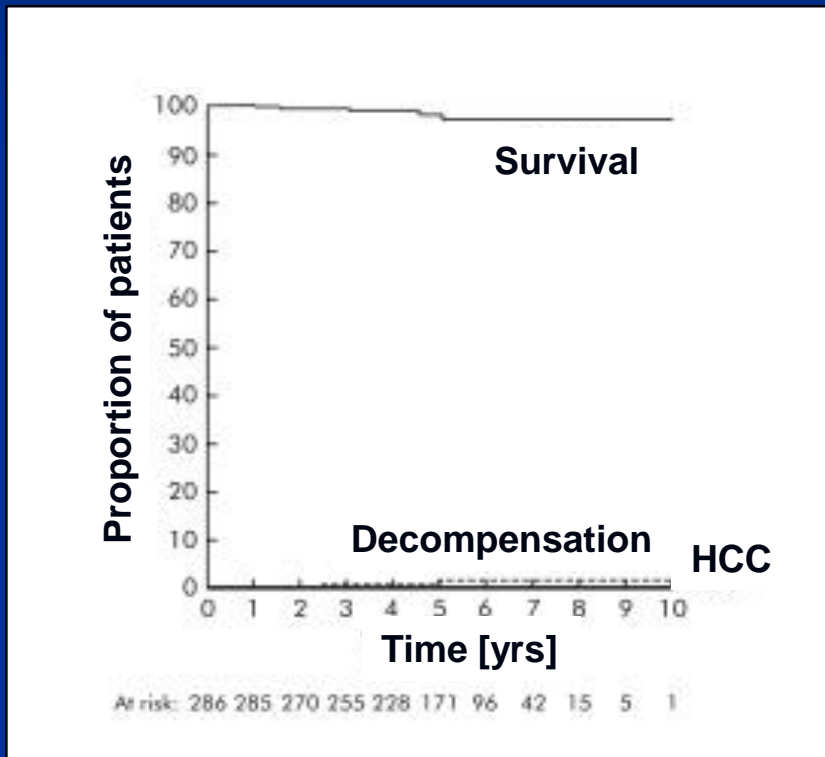


# Treatment

- HCV is a **CURABLE** infection
- No small feat – first curable chronic viral infection

# Is SVR is a cure?

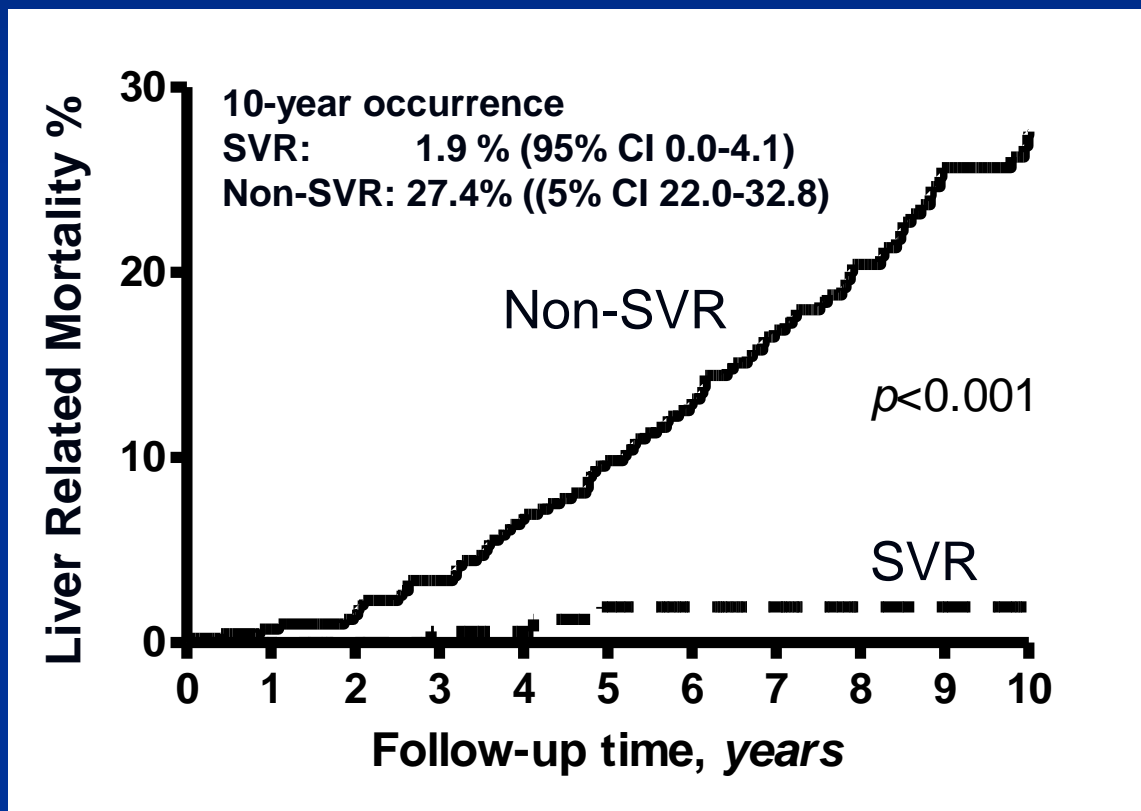
286 pts with mild liver damage and SVR after IFN therapy



- Cure stops progression of liver disease
- Normal survival in those with mild disease

# What about patients with advanced disease?

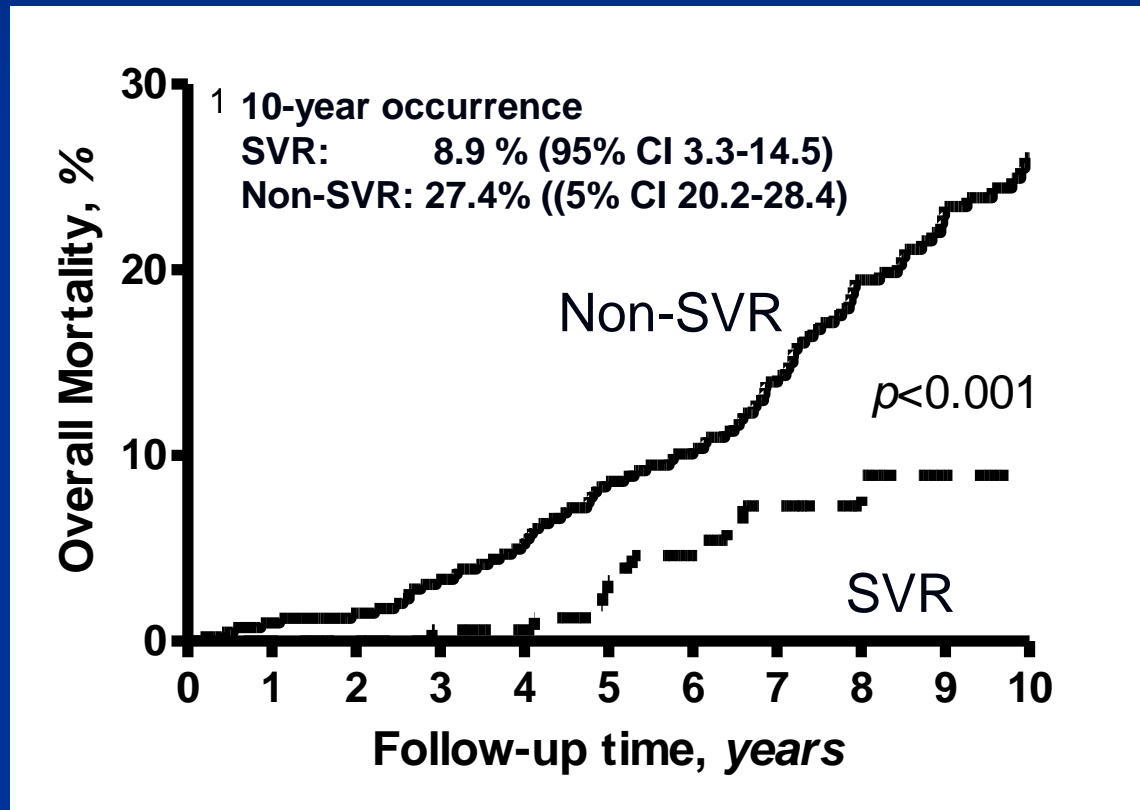
Long-term follow-up of 534 patients with advanced liver damage



SVR eliminates liver failure & liver-related death

# SVR Reduces *All-Cause* Mortality

Long-term follow-up of 534 patients with advanced liver damage



SVR is not a surrogate = reduced **all-cause** mortality

# Bottom line on SVR

## Without cirrhosis

- SVR = cure → normal life expectancy

## With cirrhosis

- SVR eliminates liver failure
- SVR greatly reduces the risk of HCC
- SVR improves liver-related **AND** overall survival
- Reduces risk of non-liver complications of HCV
- SVR normalizes life expectancy

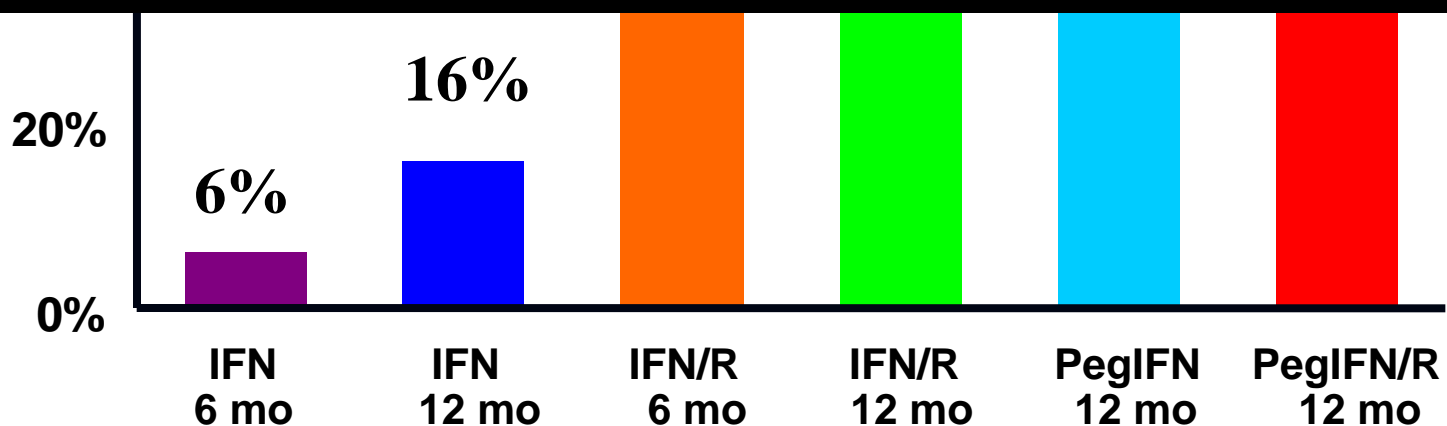


# The Good News...

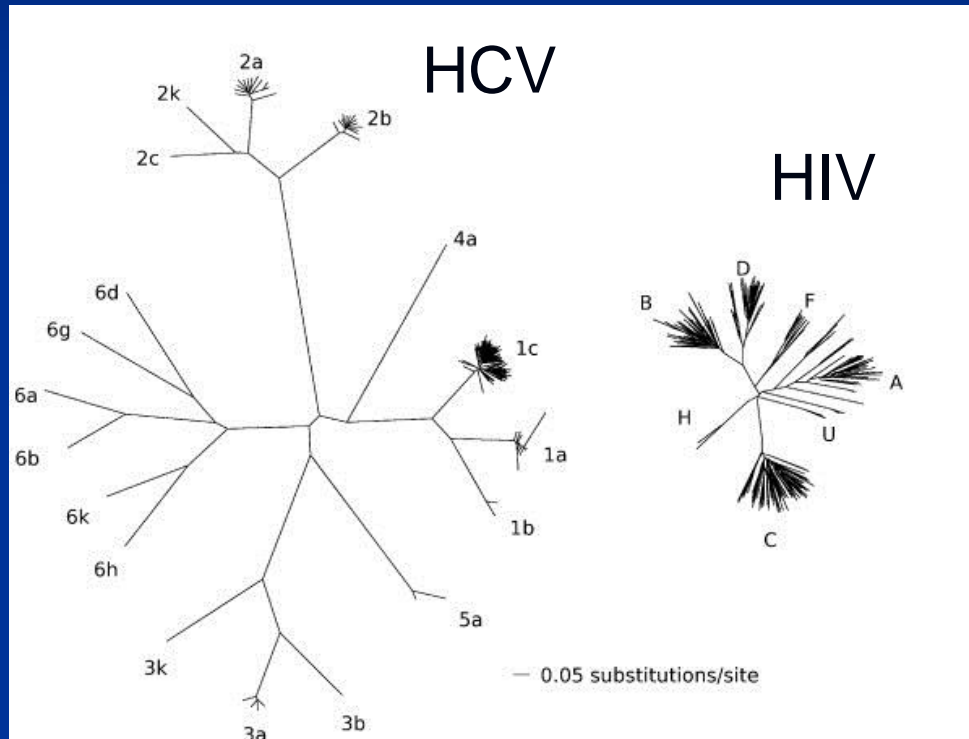


# The Bad News...

This slide is 13 years old!!!



# Why has it taken so long?



Remarkable Diversity



Toxicity of Early DAAs

# The Real Reason...



HIV Lobby

HCV Lobby

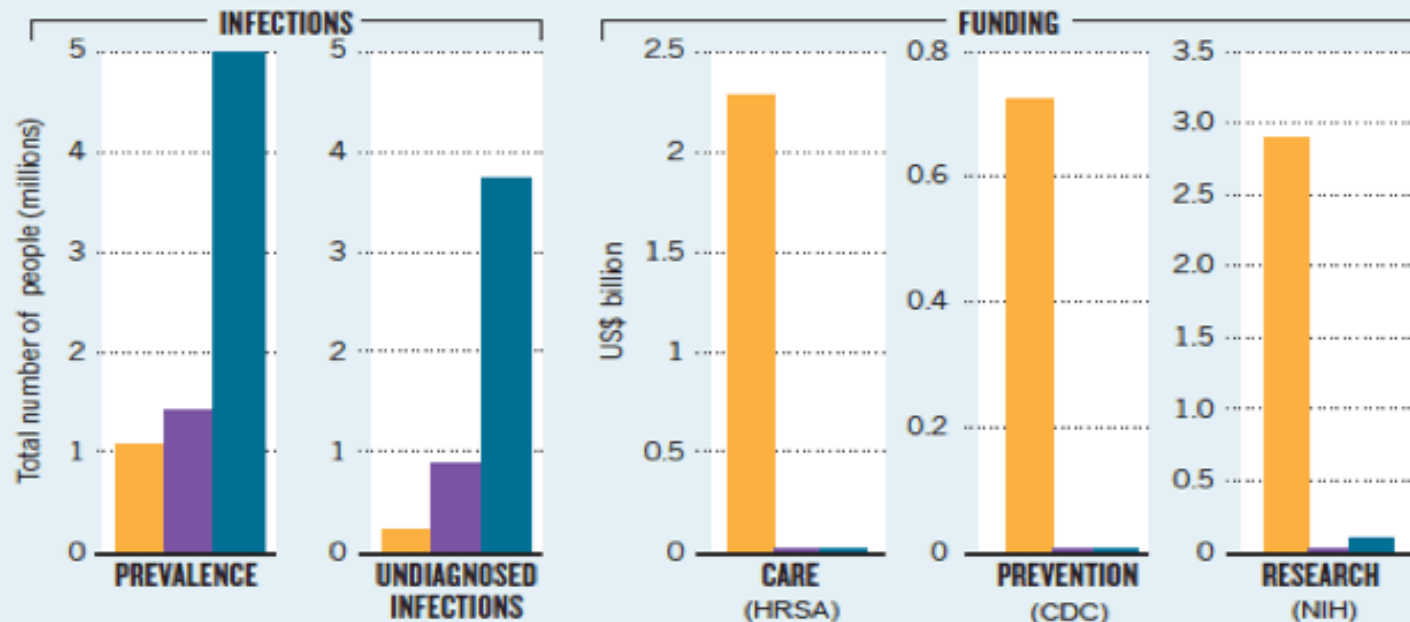


# Not just a theory....

## US RESPONSE TO HIV AND VIRAL HEPATITIS EPIDEMICS

Hepatitis C infection is at least five times more prevalent as HIV infection in the United States, yet funding lags far behind.

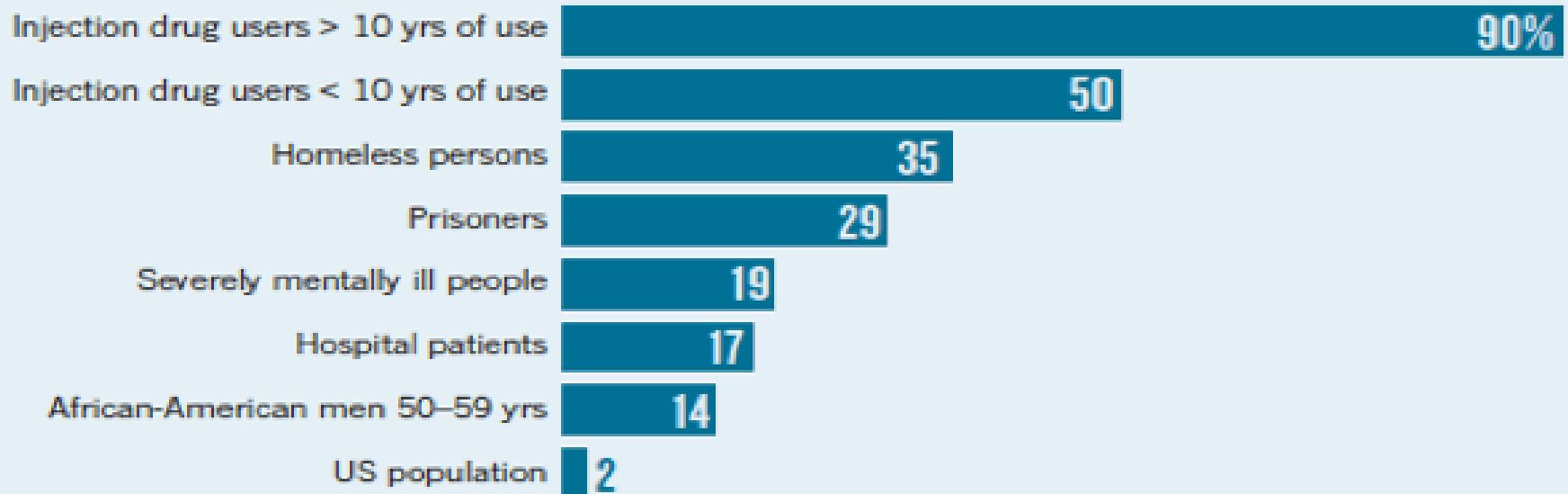
■ HIV ■ HBV ■ HCV



# Why is this the reality?

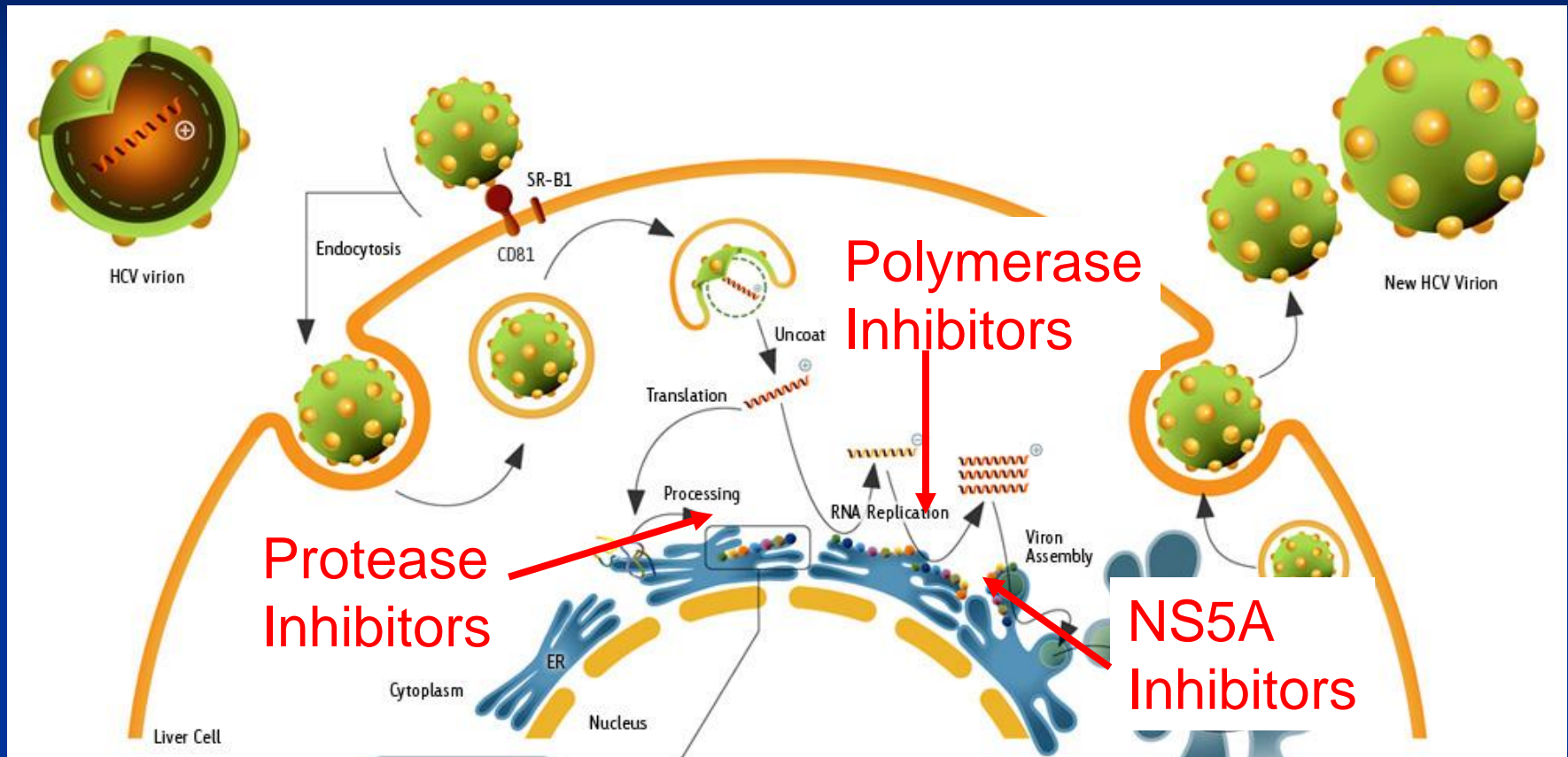
## HEPATITIS C IS A DISEASE OF THE MARGINALIZED

Hepatitis C disproportionately affects groups who are under-represented in health surveillance systems and underserved by the healthcare system. Percentage of each group testing positive for HCV infection.



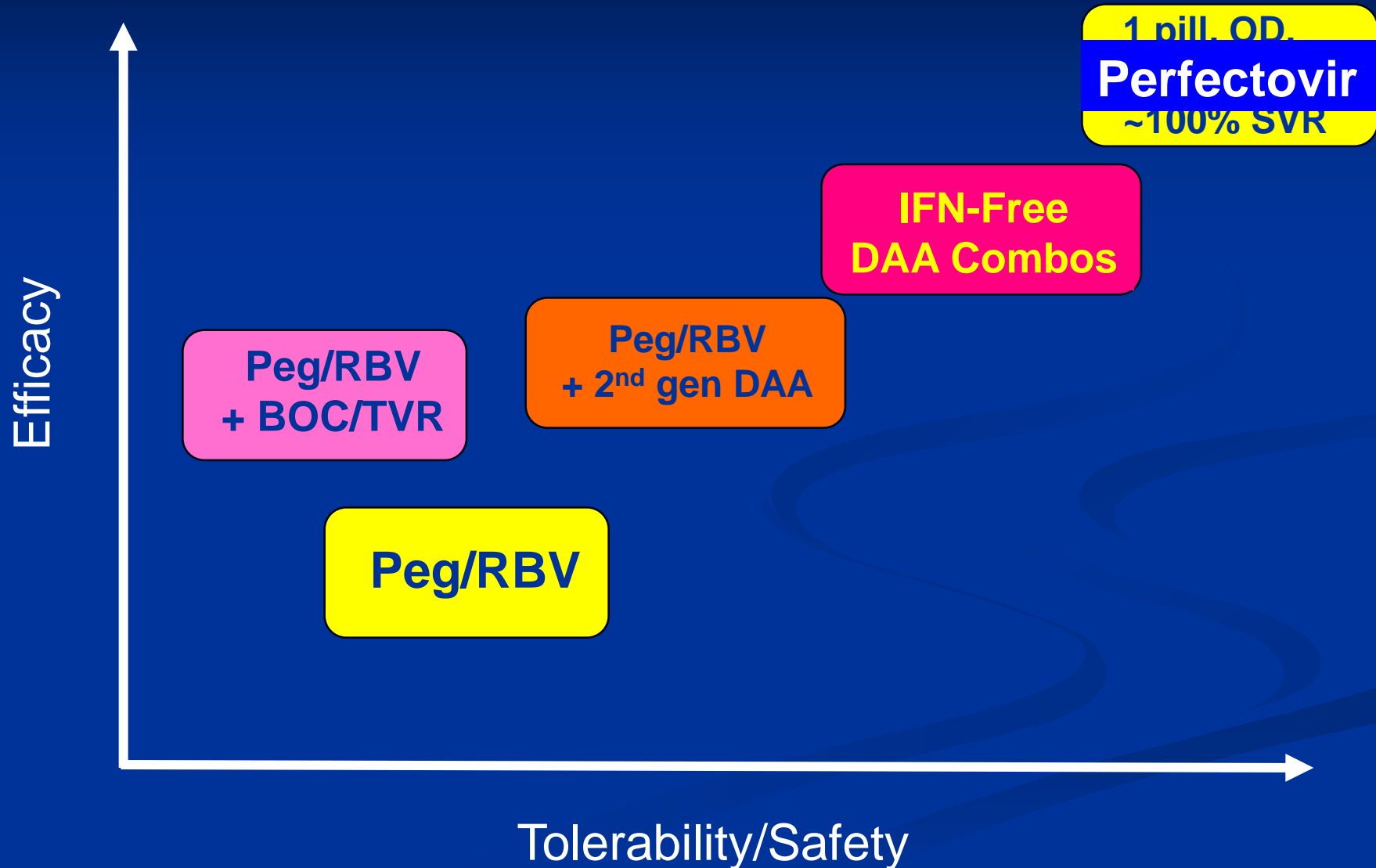
Add immigrants to the list in Canada

# Fortunately...there has been progress



Plus host inhibitors –  
Alisporivir (cyclophilin), Miravirsen – (miR122)

# Very Rapid Progress



# 22 HCV Trials in NEJM since 2011

The NEW ENGLAND JOURNAL of MEDICINE  
ORIGINAL ARTICLE

Retreatment of HCV with ABT-450/r-Ombitasvir and Dasabuvir with Ribavirin

The NEW ENGLAND JOURNAL of MEDICINE  
ORIGINAL ARTICLE

Ledipasvir and Sofosbuvir for 8 or 12 Weeks for Chronic HCV without Cirrhosis

The NEW ENGLAND JOURNAL of MEDICINE  
ORIGINAL ARTICLE

ABT-450/r-Ombitasvir and Dasabuvir with Ribavirin for Hepatitis C with Cirrhosis

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The NEW ENGLAND  
JOURNAL of MEDICINE

ESTABLISHED IN 1812

APRIL 17, 2014

VOL. 370 NO. 16

Ledipasvir and Sofosbuvir for Previously Treated HCV Genotype 1 Infection

The NEW ENGLAND JOURNAL of MEDICINE  
ORIGINAL ARTICLE

Ledipasvir and Sofosbuvir for Untreated HCV Genotype 1 Infection



# Perfectovir will soon be a reality

No AEs

>95%  
SVR

IFN-free

RBV-free

No DDIs

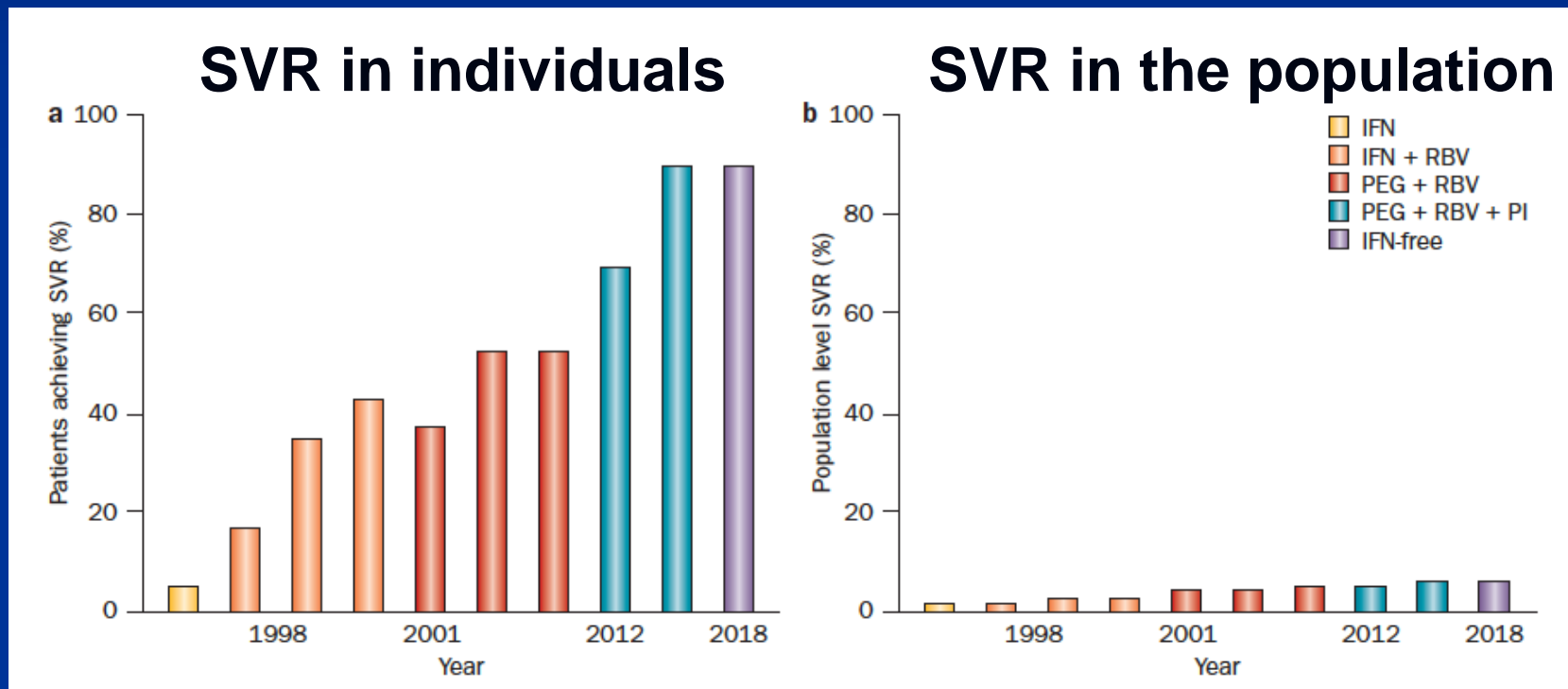
6-12  
weeks

1 pill OD

Minimal/No  
Resistance

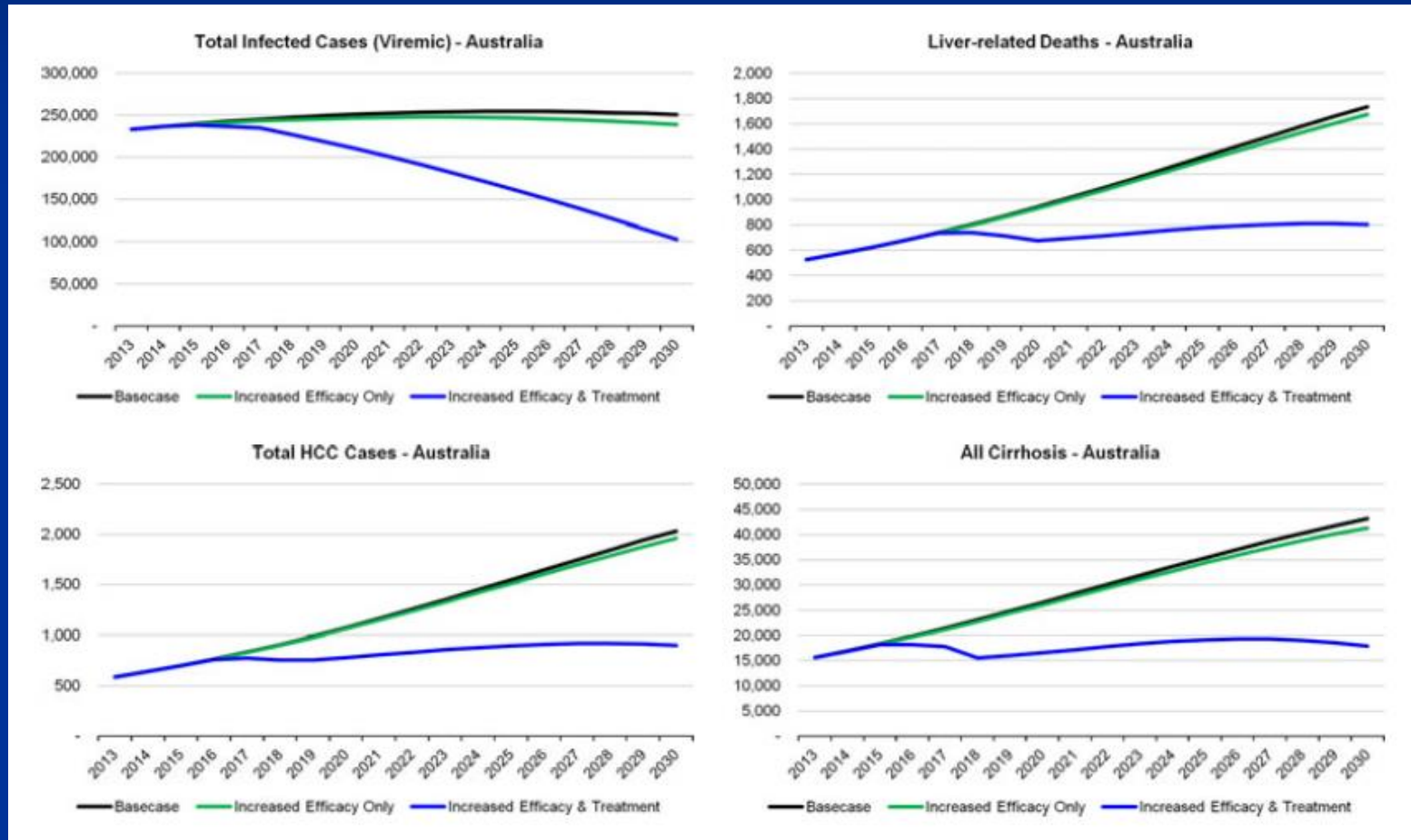


# Treatment uptake more important than SVR rate



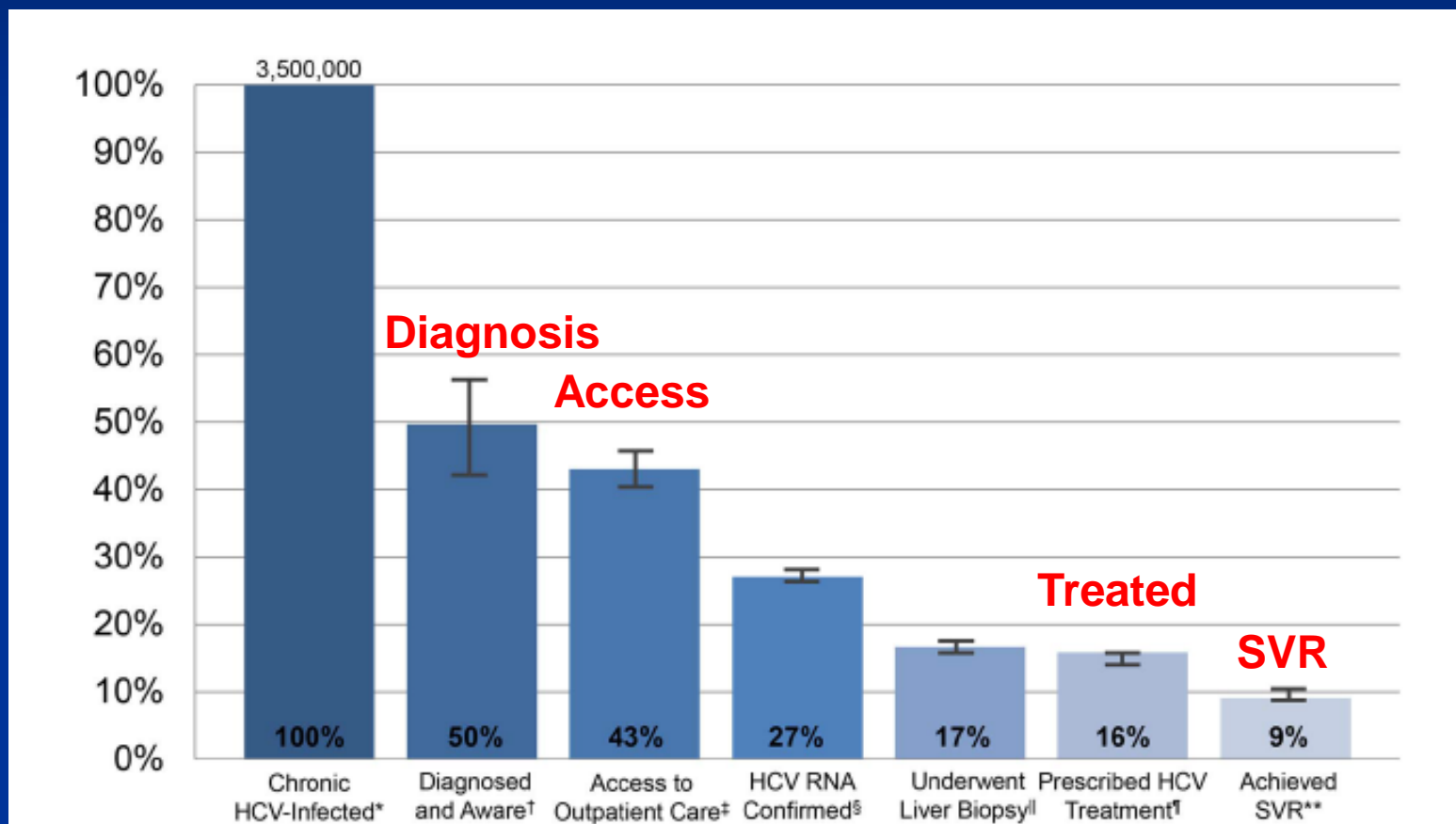
- Improved therapy of no benefit unless treatment rates increase
- Diagnosis rate in Canada → may be as low as 30%!!!

# Elimination takes more than good drugs



# With difficult, ineffective therapy...patients were not exactly lining up

Modeled data for non-VA US population



Should improve with IFN-free therapy but long way to go...

# Treatment



Shouldn't this be easy?

# Not necessarily on the same page...



# Patient Perspective



Liver Clinic



# If only it were that easy!

## Patients

- Unaware of infection → feel perfectly well
- If you have never had IFN, you don't know how much better IFN-free therapy is
- Treatment still very difficult – even perfectovir

## Doctors

- Poor awareness – late diagnosis and referral
  - 57% of PCPs do not know HCV is curable!
- Few treaters – hepatologists, GIs, IDs
- Will PCPs take up treatment like in HIV?

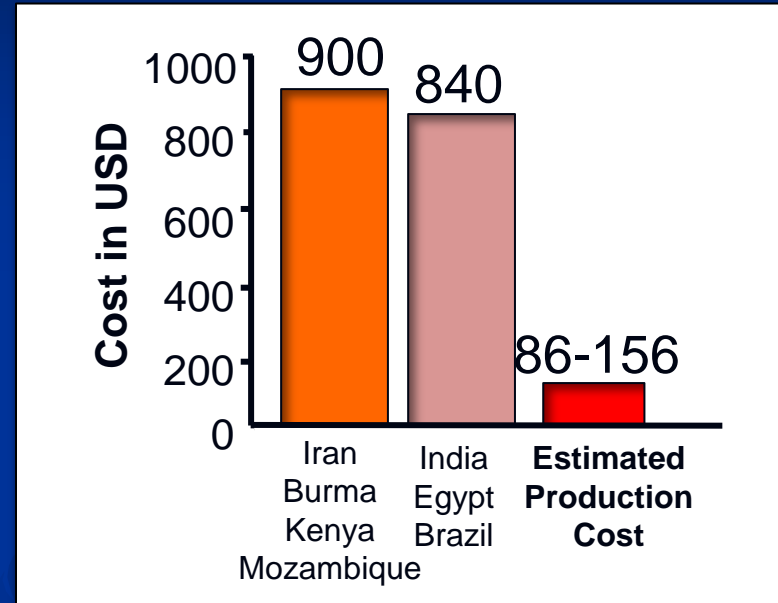
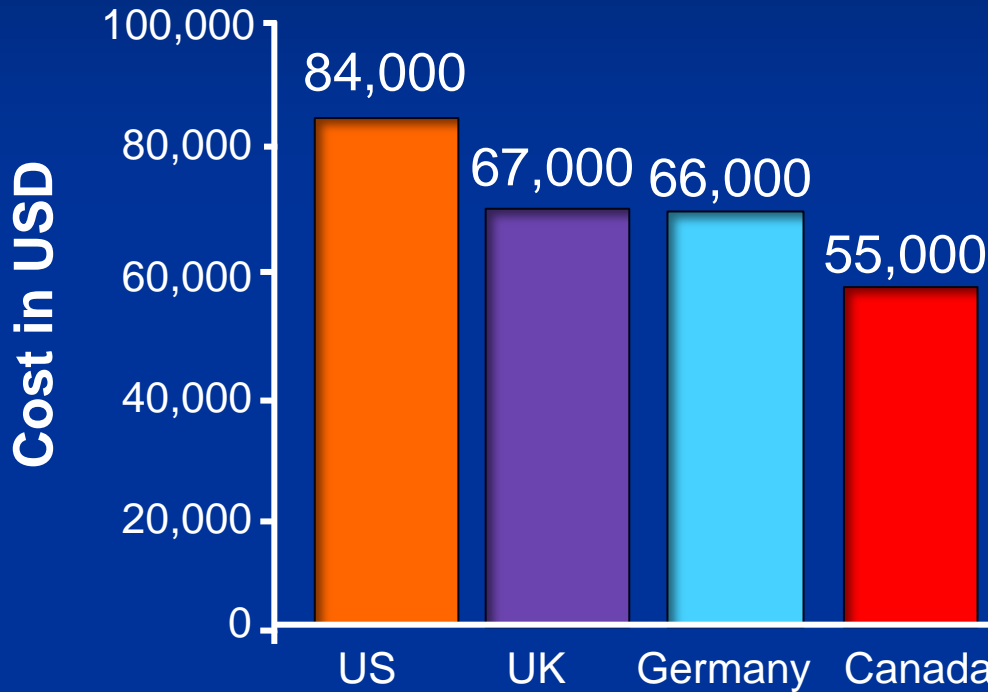


# The payers' position



It costs  
what????

# Costs for 12 weeks of Sofosbuvir



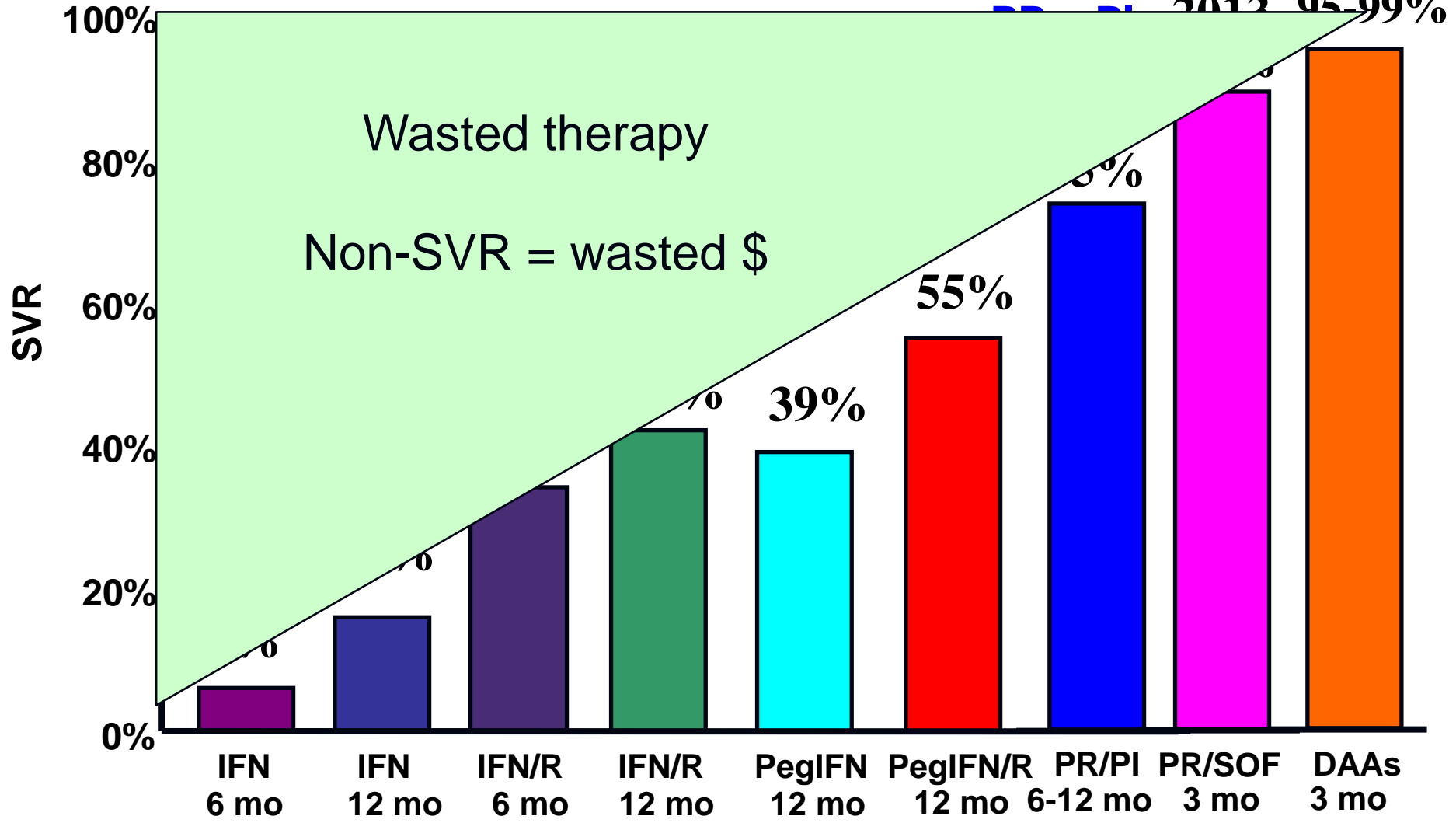
900 840 86-156  
 Iran India **Estimated**  
 Burma Egypt **Production**  
 Kenya Brazil **Cost**  
 Mozambique

This model has worked for HIV but pushback from US & other wealthy countries

**DAAs**

**PR + NI 2014**

**PR + NI 2012 05-99%**



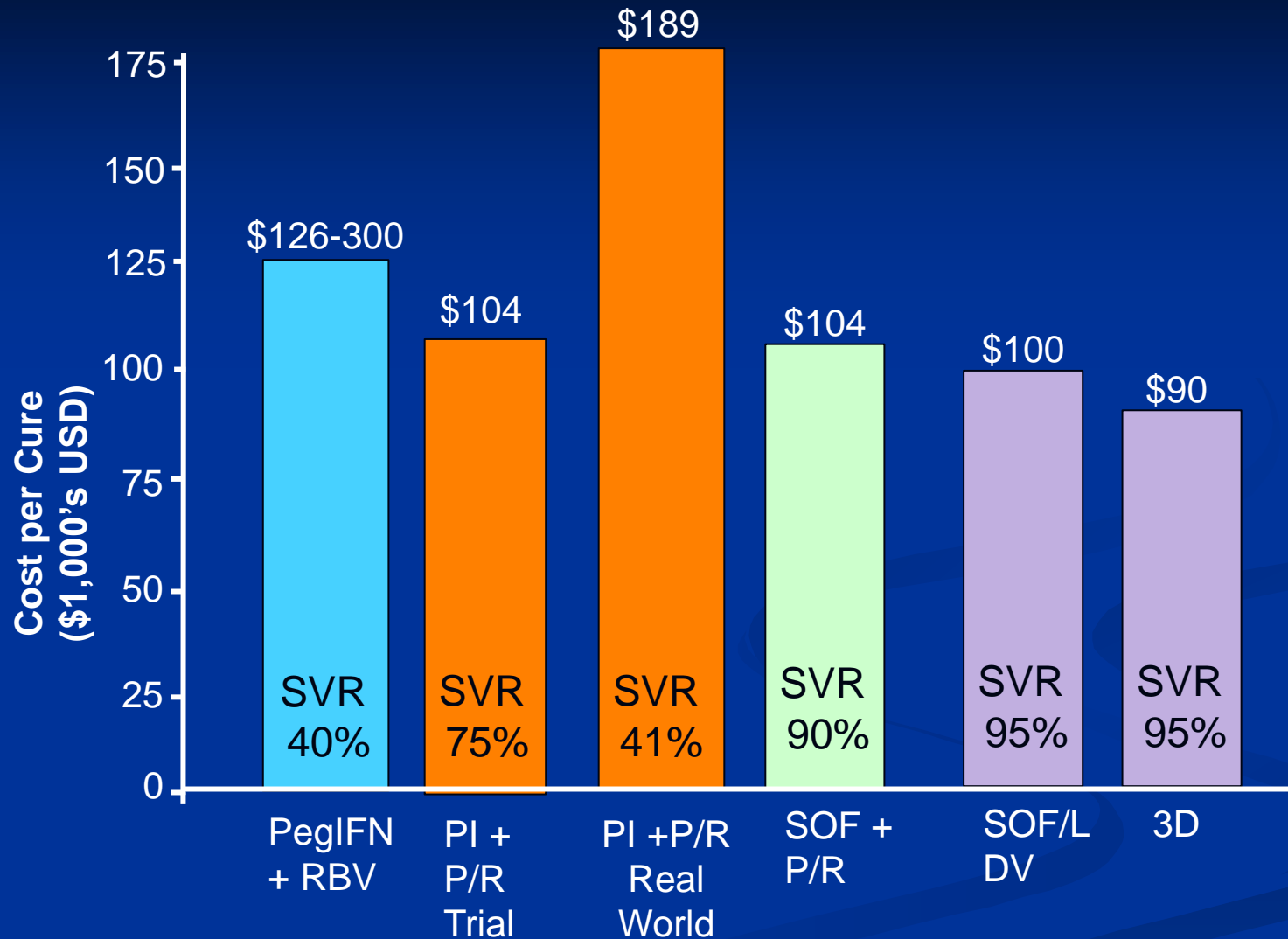
Wasted therapy

Non-SVR = wasted \$

SVR

IFN 6 mo IFN 12 mo IFN/R 6 mo IFN/R 12 mo PegIFN 12 mo PegIFN/R 12 mo PR/PI 6-12 mo PR/SOF 3 mo DAAs 3 mo

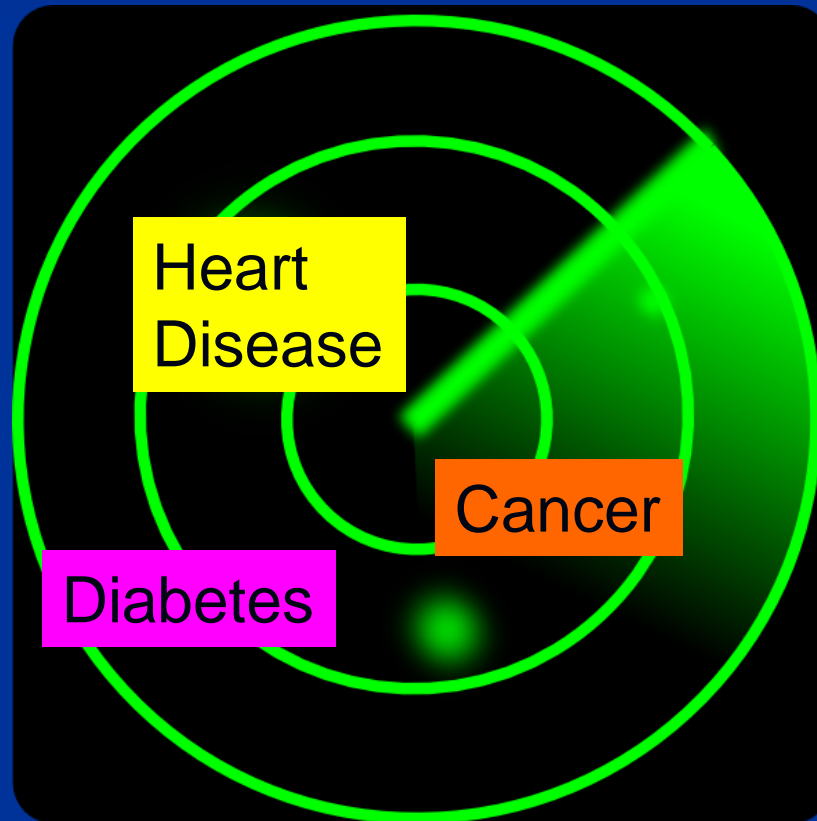
# Cost per cure actually going down



- Lower in Canada – treatment highly cost-effective
- Curative therapy → short-term cost, long-term savings

# Society

- Put simply...they don't know and they don't care!



HCV

# Other Challenges to HCV Care

- Prevention
  - Harm reduction
- Screening
  - Only 30-50% of infected individuals diagnosed!
  - Baby Boomer screening
- Geography
  - Access to care a major issue in rural areas
  - Different challenges in urban/rural settings

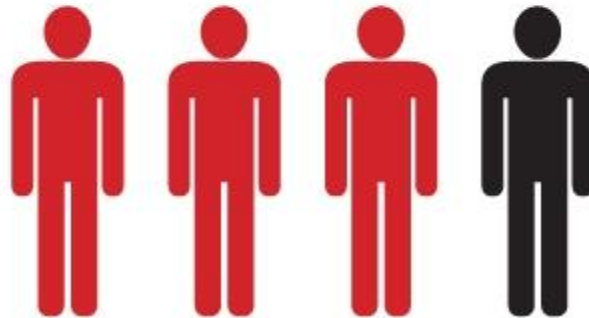
# There's an election coming...



Harm reduction is critical – prevent spread, prevent reinfection, lots of other benefits

# Did the Yanks get it right?

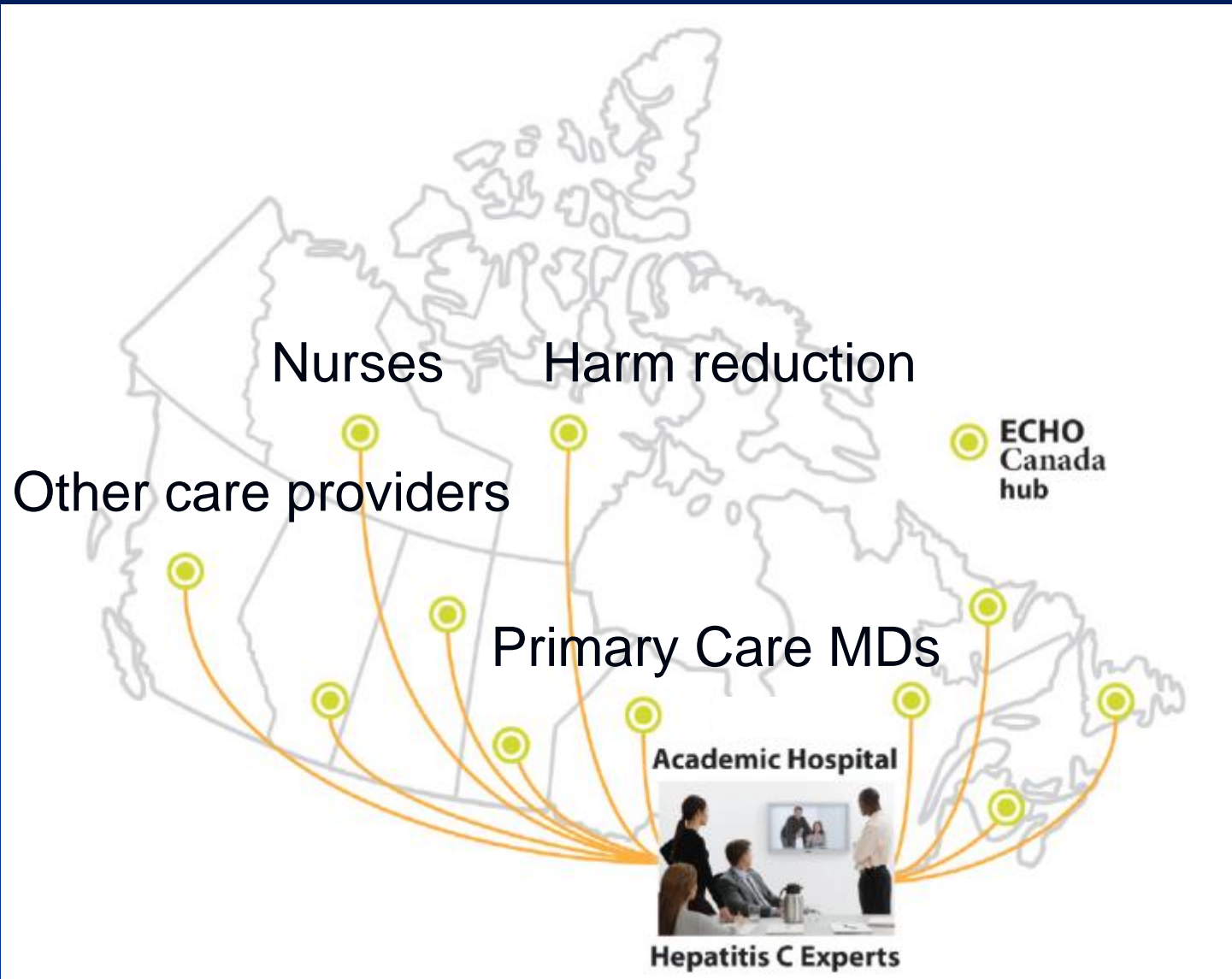
More than 75 percent of  
American adults with  
hepatitis C are baby boomers



- Birth cohort screening (1945-65) is cost-effective
- Same goes for Canada...not yet adopted



# New Models of Care



# HIV lobby = VERY effective



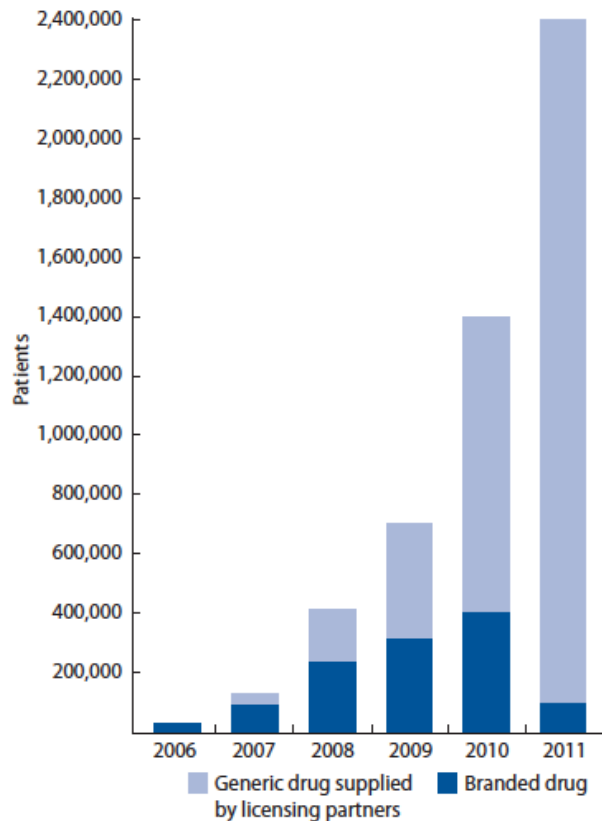
# What did lobbying achieve?



**The Global Fund**  
To Fight AIDS, Tuberculosis <sup>hepatitis</sup> and Malaria

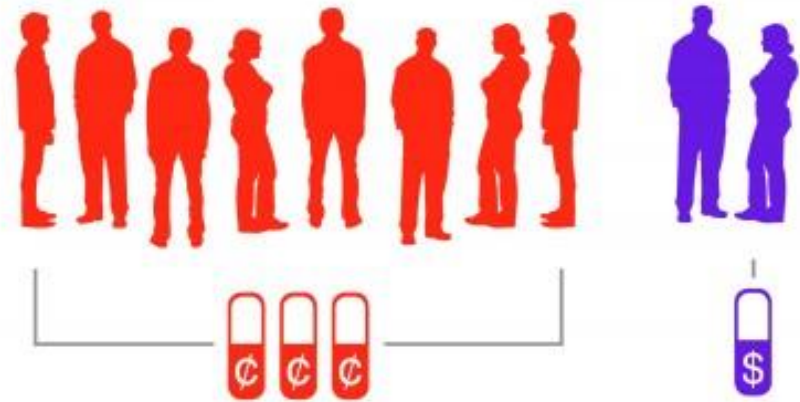
# Industry has a MAJOR role to play

Growth of the Gilead Access Program



## Vital Importance of Affordable Medicines

**80%** of Developing-Country ARVs are Generics Produced in India



Source: Waring B, Diedrichsen E & Moon S. A lifeline to treatment: the role of Indian generic manufacturers in supplying antiretroviral medicines to developing countries. 2010. *Journal of the International AIDS Society*, 13:35.

# We're learning...



# Summary – A Rare Opportunity

- Remarkable evolution in HCV therapy → 95% cure for most people
- Still many challenges to overcome
  - Under-diagnosis
  - Under-treatment
  - Access issues
  - Reinfection
- If we work together, we can create an HCV-free Canada

NOW THIS IS NOT THE **END**  
IT IS NOT EVEN  
THE **BEGINNING** OF THE **END**  
BUT IT IS, PERHAPS  
THE **END** OF THE **BEGINNING**

*Winston Churchill*



Was he talking about HCV in the era of perfectovir?

