

# Bilharziose et hépatite C en Egypte

Comment une maladie du foie en a remplacé une autre.

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CEMI 15 – 17 et 18 mai 2010 Institut Pasteur Paris



Bullin  
(*Bulinus truncatus*)

(Source images:  
Ziskind, Néphrol  
et Thér., 2009).

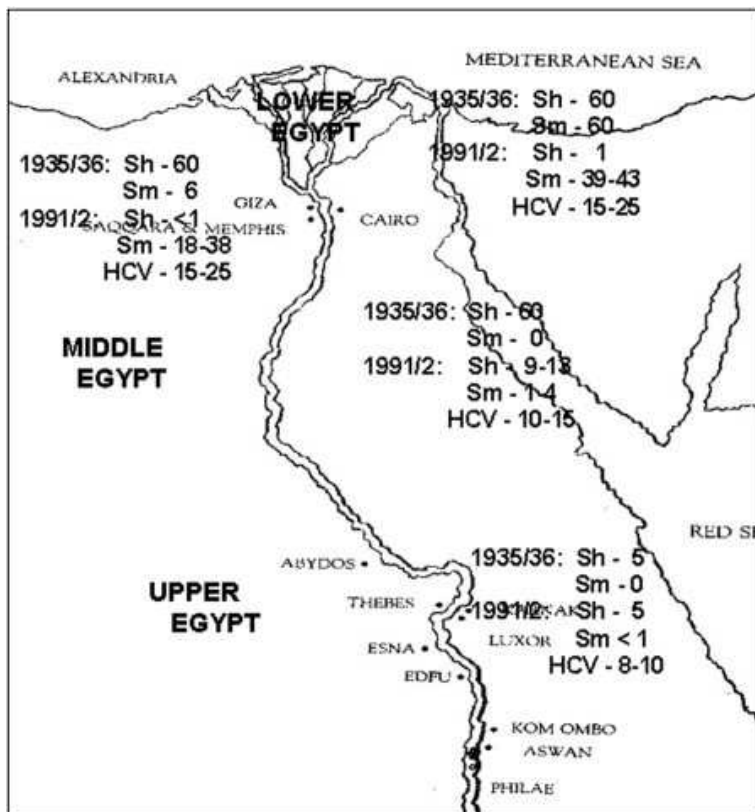


Œuf de bilharzie  
(*S. hematobium*)



Couple de bilharzies adultes

# Schistosomiasis prevalence in Egypt, 1935 and 1991



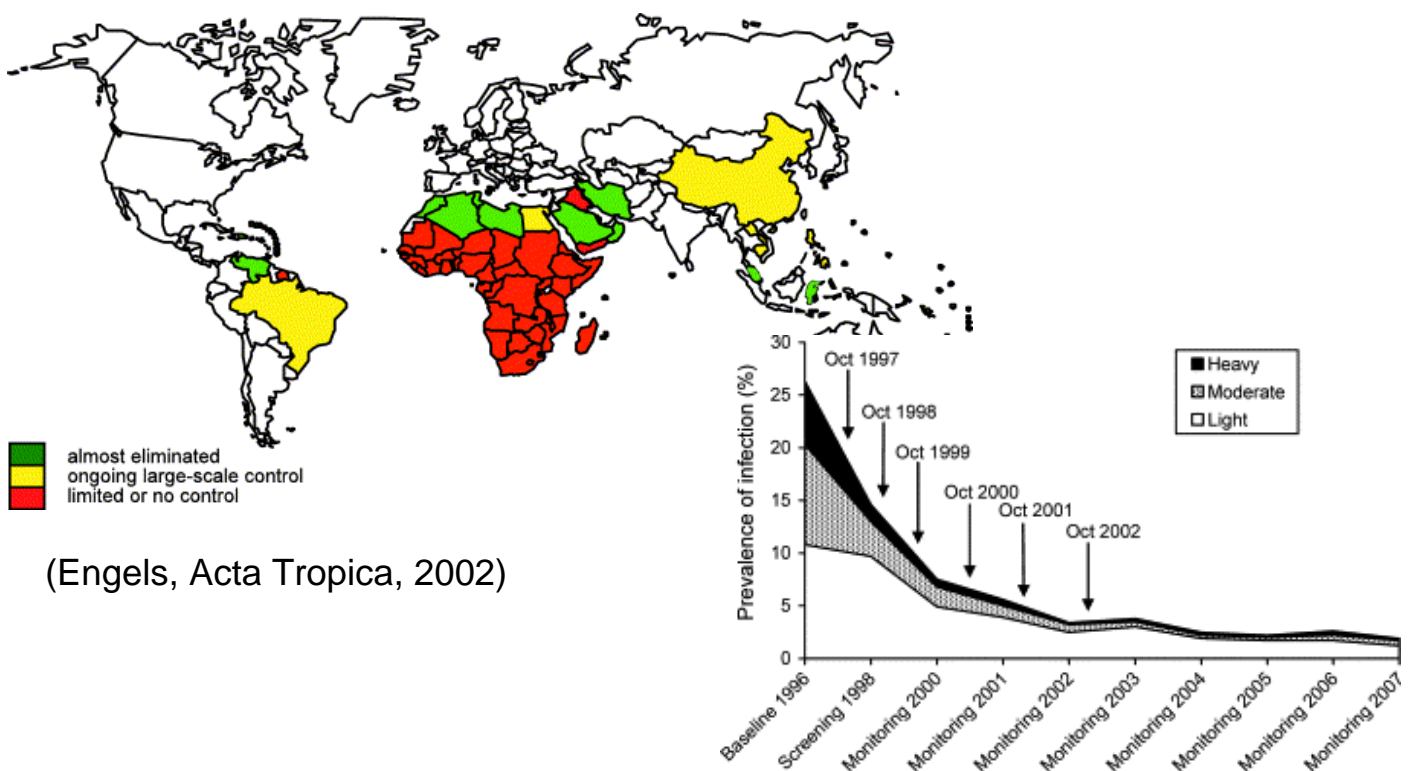
Two events:

-Aswan High Dam (1960)

-Bilharzia treatment campaigns (1960s-80s)

(Strickland, Hepatology, 2006)

# Bilharzia situation in the world, and in Egypt



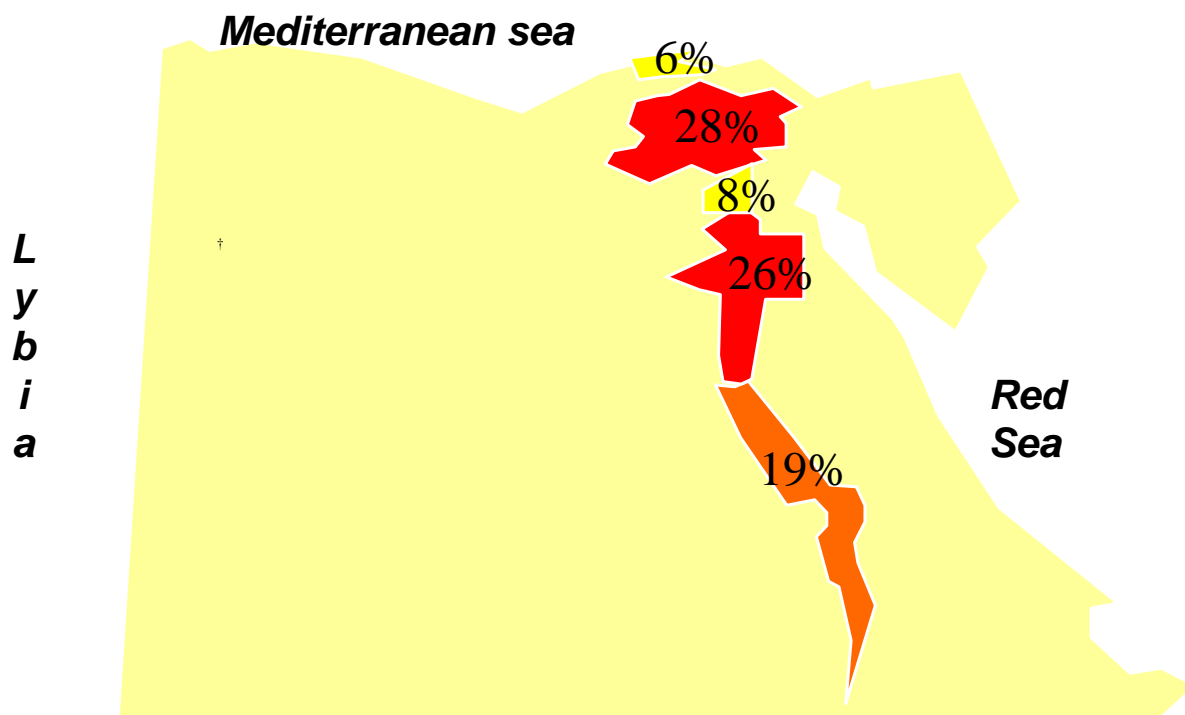
(Engels, Acta Tropica, 2002)

Curtale F, Trans Roy Soc Med Hyg, 2010)

# HCV epidemiology in Egypt

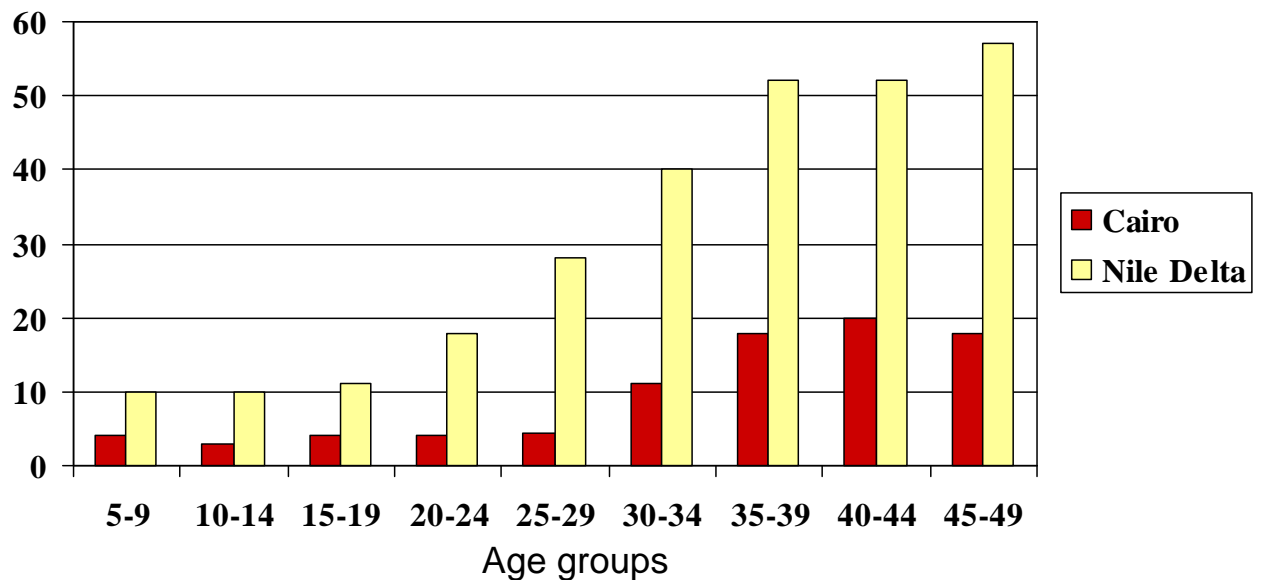
- Hepatitis C Virus (HCV): new virus responsible for the vast majority of “non-A non-B post transfusion hepatitis” discovered in 1989.
  - Antibody screening tests available in the mid-1990s.
  - High prevalence of anti-HCV antibodies:
    - Visa attendees (Mohamed, MK, 1996)
    - National survey (MOH, 1996)
    - Blood donors (Arthur, 1997)
    - ...
- Prevalence > 20% among adults

## Proportion with HCV antibodies among 10-50 years old, national survey, 1996



# HCV antibody prevalence by age group, national survey, 1996

HCV antibody prevalence (%)



From Franck et al, Lancet, 2000

## HCV epidemiology in Egypt (cont.)

- Other data on HCV prevalence:
    - Rural > urban > desert (Arthur, 1997)
    - Higher in areas with high schistosomiasis prevalence
  - And very little genetic diversity (genotype 4) (Quinti, 1997)
- suggest relationship between mass treatment campaigns for schistosomiasis in the 1960s-70s and the HCV epidemic.

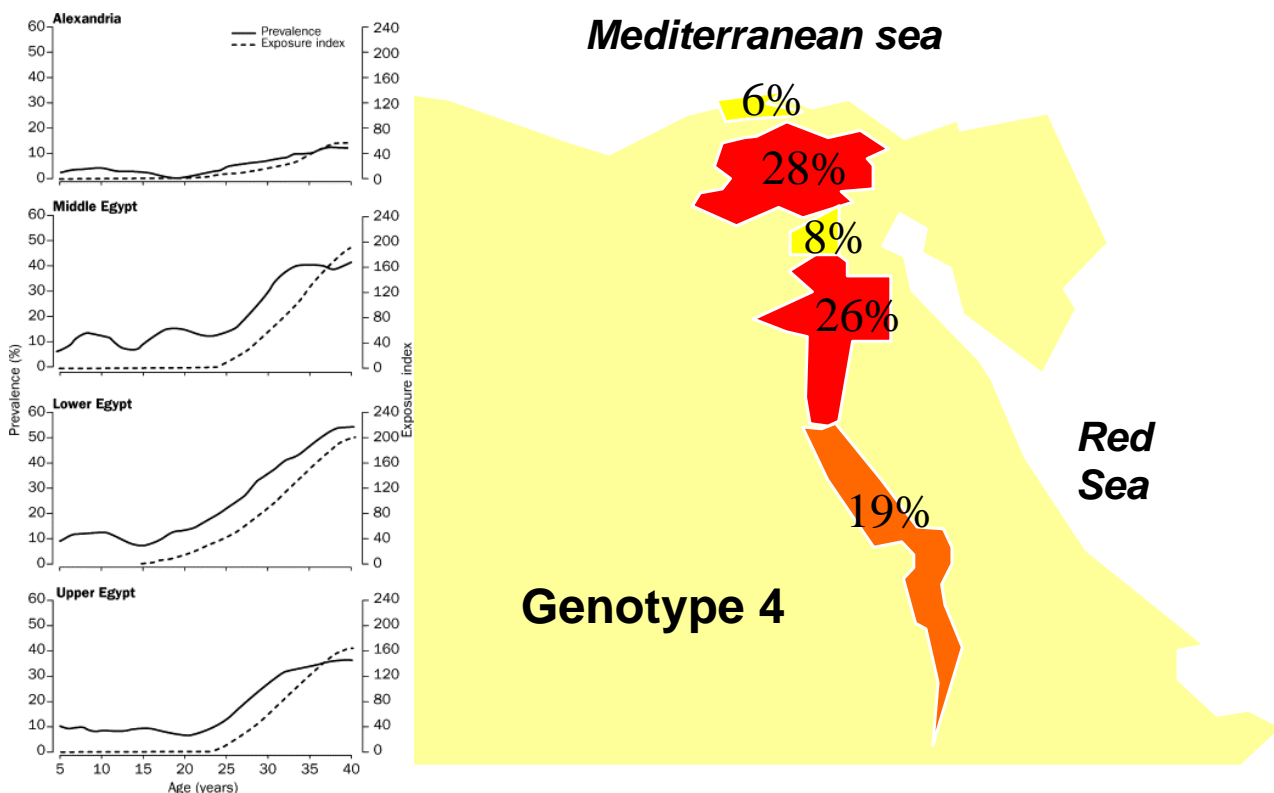
# HCV transmission:

## What we knew from industrialised countries



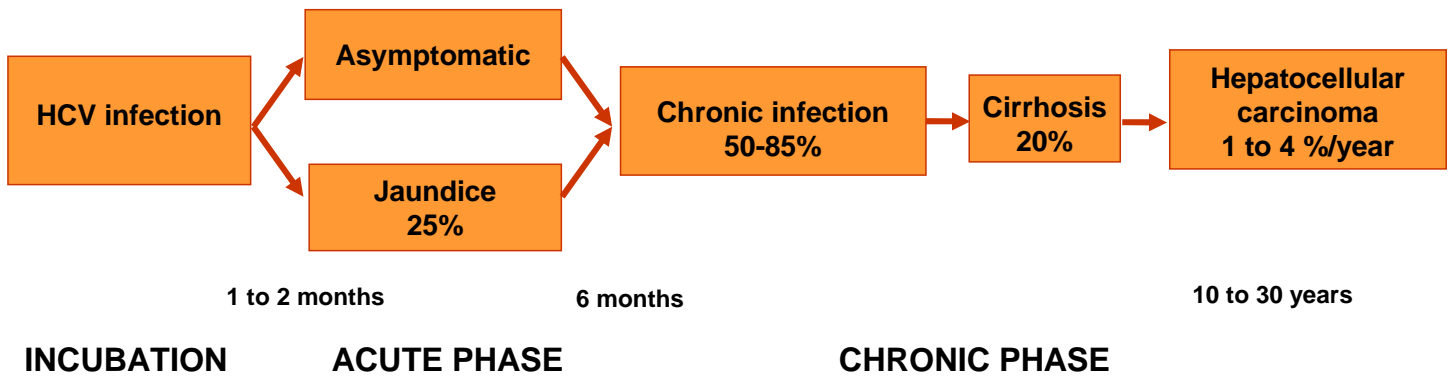
- **Contact with infected blood:**
  - **Blood transfusion**
  - **Injections: illicit drug use, medical**
  - **Invasive medical procedures: surgery, endoscopy, ...**
  - **Tattooing, acupuncture, body-piercing, shaving,...**
- **Mother-to-infant: 5%**
- **Sexual: debated.**

## Proportion with HCV antibodies among 10-50 years old, national survey, 1996



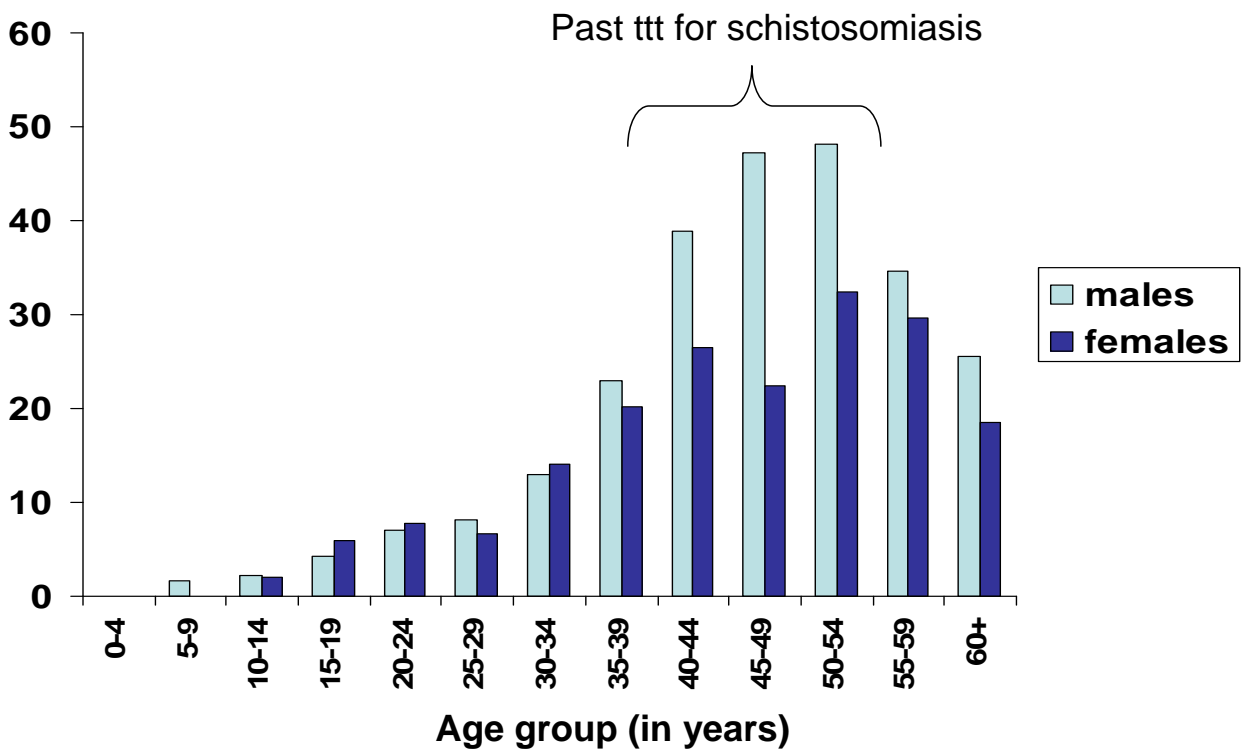
(Frank C et al, Lancet, 2000)

# Natural history of HCV infection



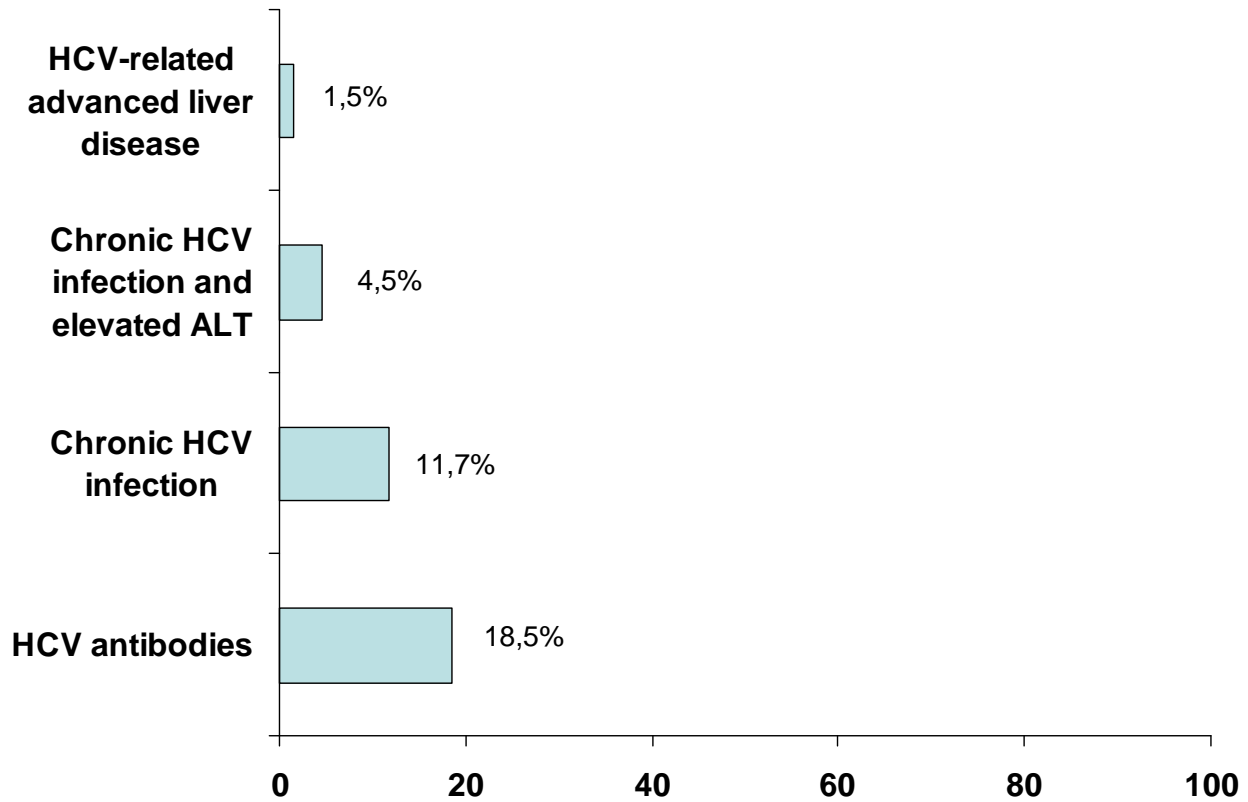
## HCV antibody prevalence (%) by age and sex Zwyat Razin, 2002 (n = 4020) (ANRS 1211).

HCV antibody prevalence (%)



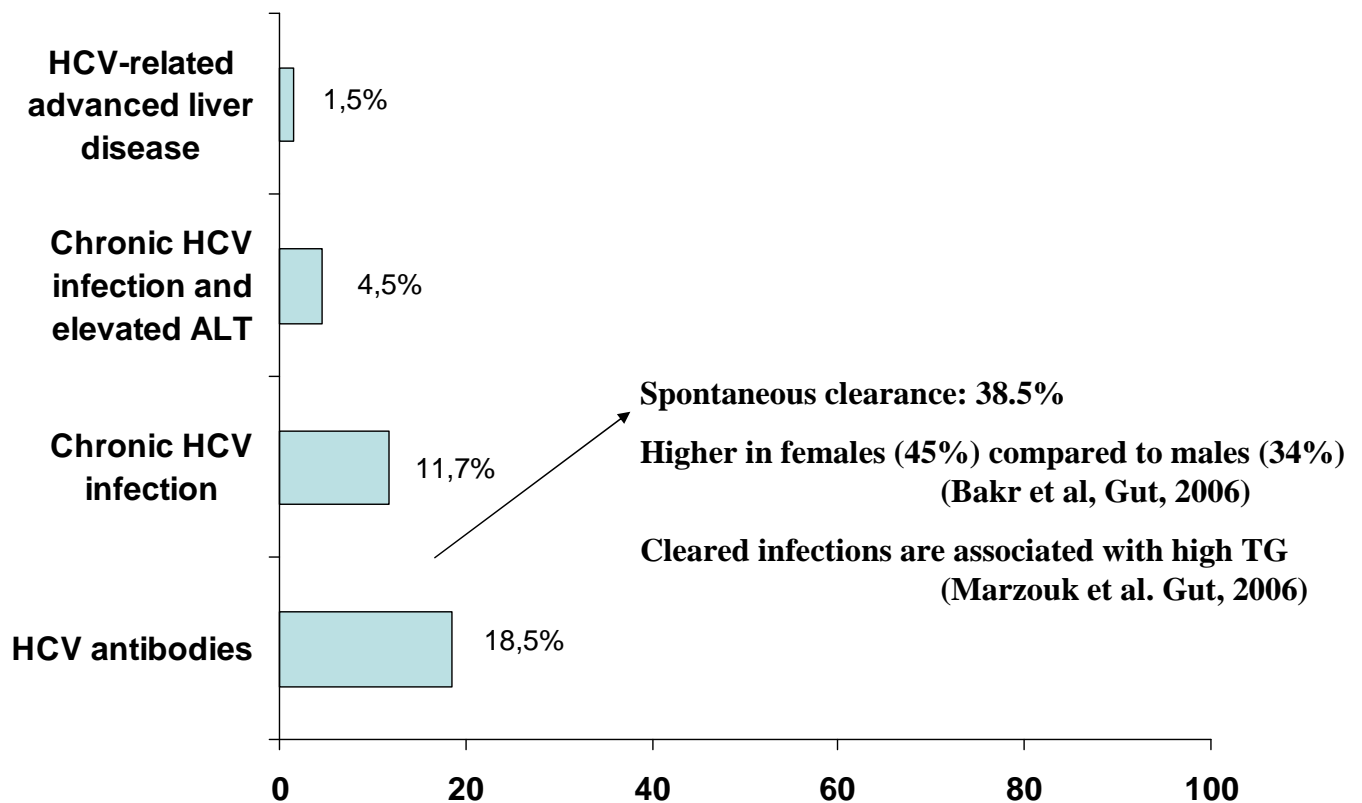
(Arafa et al, J Hepatol, 2005)

# HCV-related morbidity among adults (n= 2425), Zwyat Razin, 2002.



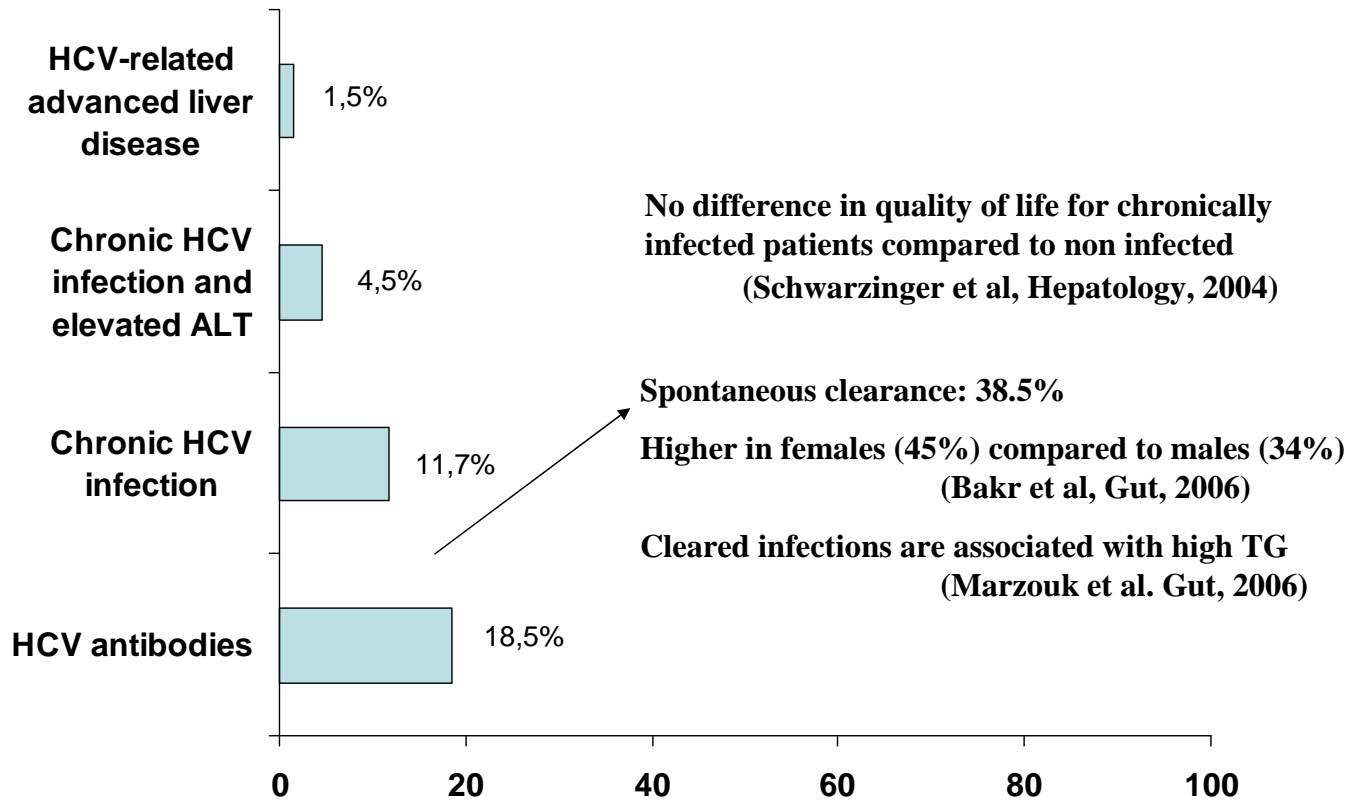
(Mohamed MK, J Med Virol, 2006)

# HCV-related morbidity among adults (n= 2425), Zwyat Razin, 2002.



(Mohamed MK, J Med Virol, 2006)

# HCV-related morbidity among adults (n= 2425), Zwyat Razin, 2002.



No difference in quality of life for chronically infected patients compared to non infected  
(Schwarzinger et al, Hepatology, 2004)

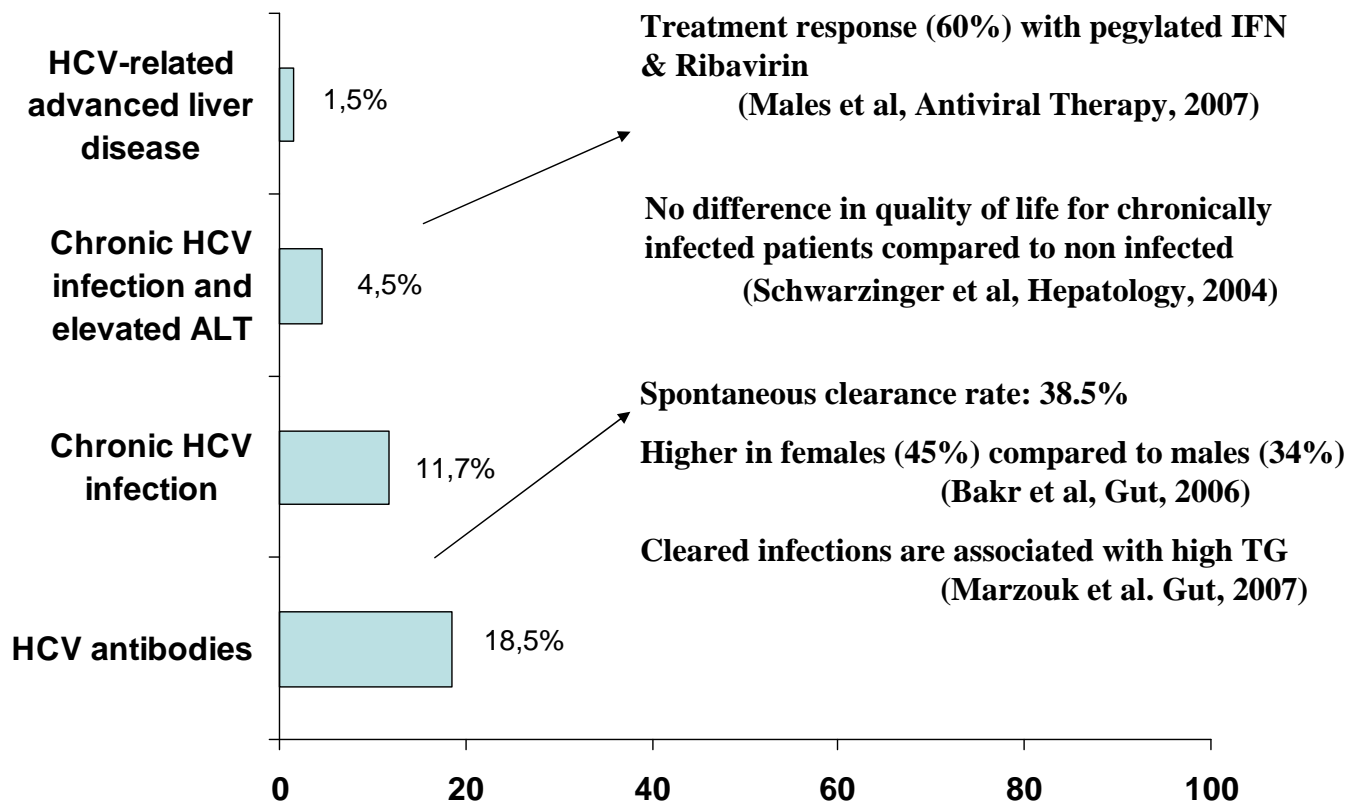
Spontaneous clearance: 38.5%

Higher in females (45%) compared to males (34%)  
(Bakr et al, Gut, 2006)

Cleared infections are associated with high TG  
(Marzouk et al. Gut, 2006)

(Mohamed MK, J Med Virol, 2006)

# HCV-related morbidity among adults (n= 2425), Zwyat Razin, 2002.



Treatment response (60%) with pegylated IFN & Ribavirin  
(Males et al, Antiviral Therapy, 2007)

No difference in quality of life for chronically infected patients compared to non infected  
(Schwarzinger et al, Hepatology, 2004)

Spontaneous clearance rate: 38.5%

Higher in females (45%) compared to males (34%)  
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Cleared infections are associated with high TG  
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(Mohamed MK, J Med Virol, 2006)

# HCV Egypt ANRS research site

- **In Egypt:**
  - Most of activities are based at the **National Hepatology and Tropical Medicine Research Institute (NHTMRI) in Cairo** and involve:
    - Ain Shams University: **epidemiology** (Prof Mostafa K Mohamed) and **immunology** (Prof Mona Rafik).
    - Cairo university: **clinical expertise** (Prof Gamal Esmat),
    - Minia University: **virology** (Prof Mohamed Abdel Hamid),
    - University of Mansoura: **pathology** (Prof Khaled Zalata).
- **In France:**
  - **Institut Pasteur**, Paris: **epidemiology** (Dr Arnaud Fontanet); **immunology** (Dr Matthew Albert),
  - Laboratory associated to the National Reference Center Viral Hepatitis: **virology** (Dr Valérie Thiers),
  - Cochin Hospital, Paris: **clinical expertise** (Prof Stanislas Pol),
  - Tenon Hospital, Paris: **clinical expertise** (Dr Philippe Bonnard)
  - EA 2694 – CERIM, Lille: **cost-effectiveness studies** (Prof Yazdan Yazdanpanah and Dr Sylvie Deuffic-Burban).
  - INSERM U550, Paris: **genetic epidemiology** (Dr Laurent Abel),
  - Beaujon Hospital, Paris: **pathology** (Prof Pierre Bedossa),
  - INSERM U758, ENS Lyon: **virology** (Dr François-Loïc Cosset),
  - Purpan hospital, Toulouse: **virology** (Prof Jacques Izopet).

## Main questions

1. What is the future of the epidemic, once the « infected cohort » will have passed away?
2. How is the virus transmitted nowadays in Egypt?
3. How effective is pegylated interferon – ribavirin against HCV genotype 4?
4. What can we learn from the one third of individuals who spontaneously clear the virus after acute infection?

# Articulation research – public health

## EGYPTIAN NATIONAL CONTROL STRATEGY FOR VIRAL HEPATITIS 2008-2012



April 2008

Arab Republic of Egypt, Ministry of Health and Population  
National Committee for the Control of Viral Hepatitis

Announced during press conference  
by the Minister of Health and Population  
on April 15, 2008

### Members of the National Committee on Viral Hepatitis

Dr. Wahid Doss Dr. Mostafa Kemal Mohamed	Committee head, Director of NHTMRI Professor of Community Medicine, Ain Shams University
Dr. Gamal Esmat	Professor of Hepatology & Gastroenterology, Cairo University
Dr. Manal El Sayed	Professor of Pediatric Hepatology, Ain Shams University
Dr. Arnaud Fontanet Dr. Stewart Cooper Dr. Nasr El Sayed	Epidemiologist, Institut Pasteur (Paris) Clinician, California Pacific Medical Center Head of Communicable Diseases, MOHP

Figure 6. Treatment Centers open in Egypt as of March 2008

