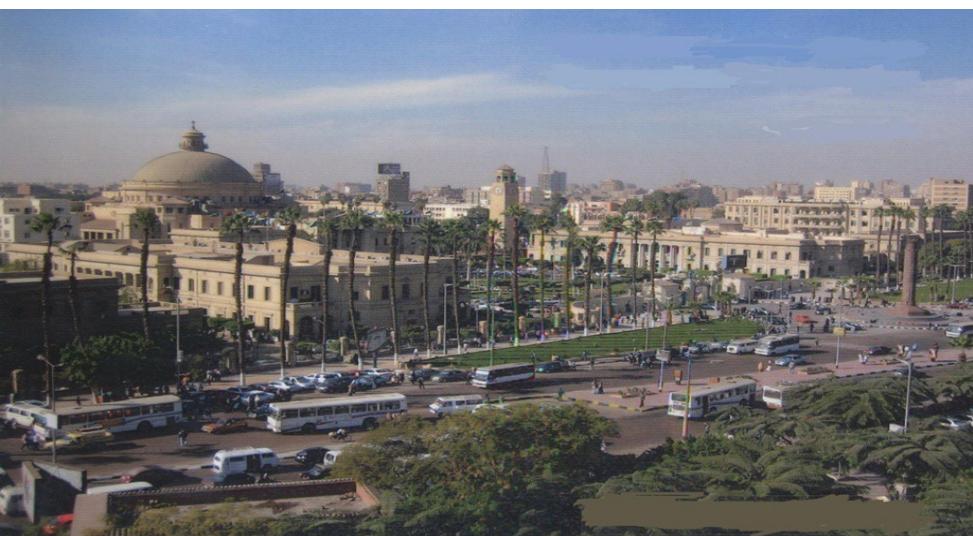




# Can We Expect Eradication in HCV G4 ?



World Health Organization

**Prof. Gamal Esmat**

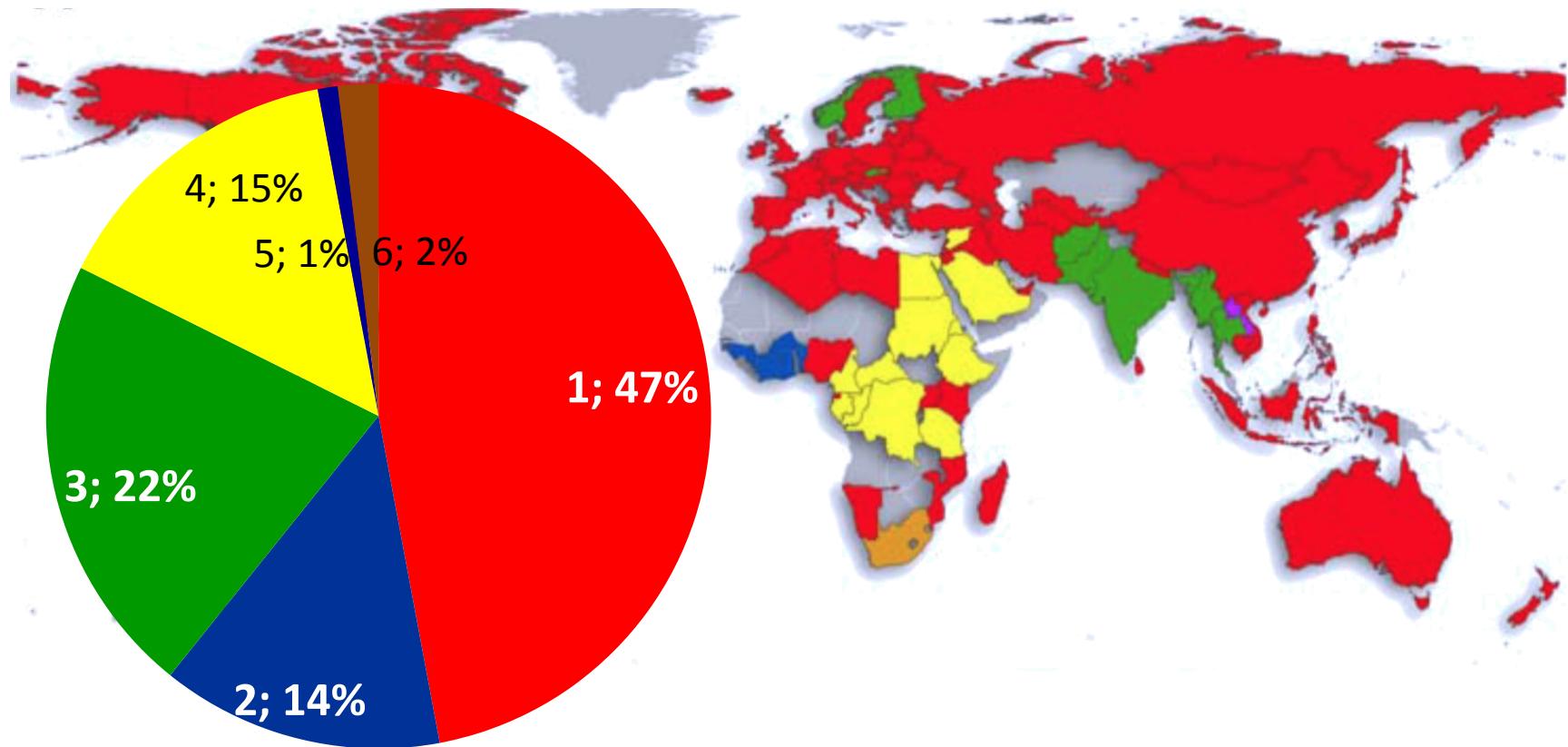
**Prof. Hepatology & Vice President of Cairo University, Egypt**

**Member of WHO Strategic Committee for Viral Hepatitis**

**[www.gamalesmat.com](http://www.gamalesmat.com)**

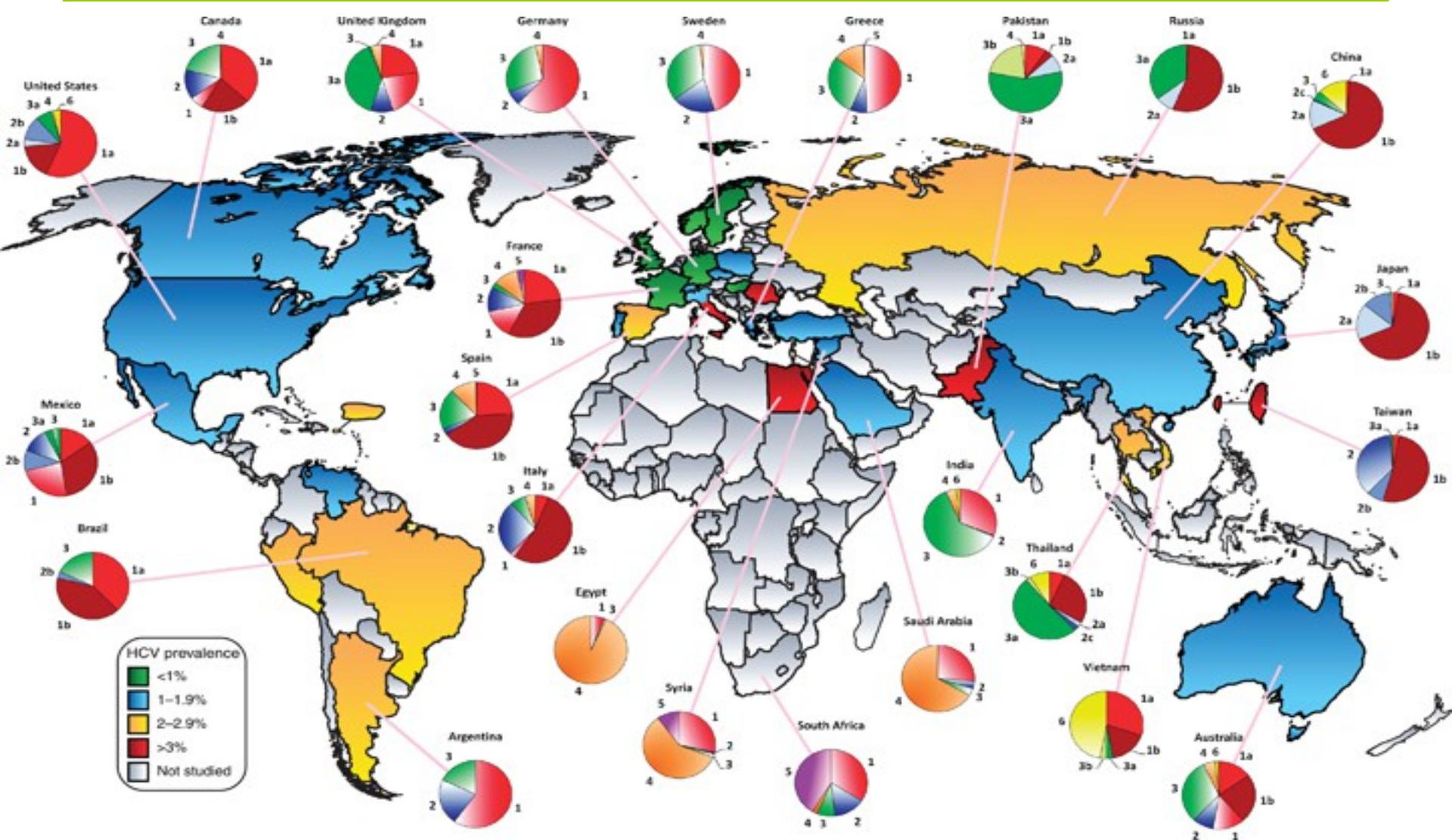
# HCV Genotype Distribution Globally

- HCV a global health challenge with ~150-180 Million chronic HCV infections
- Genotype 1 is the most prevalent in most countries

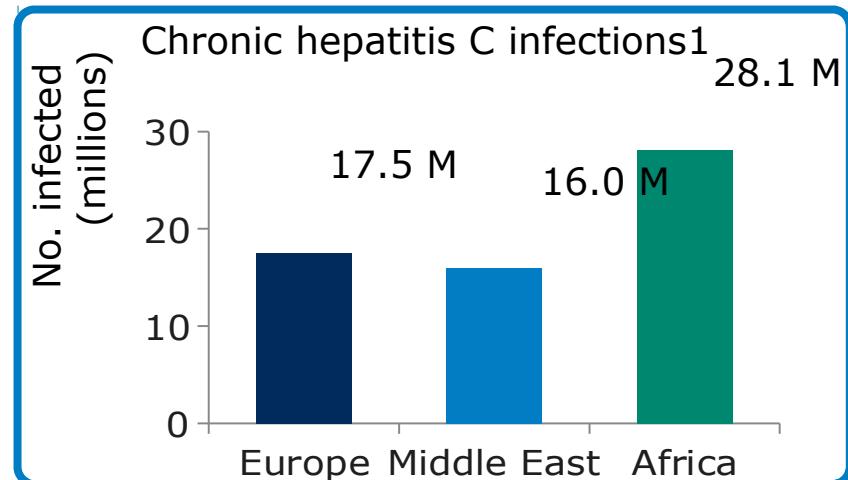
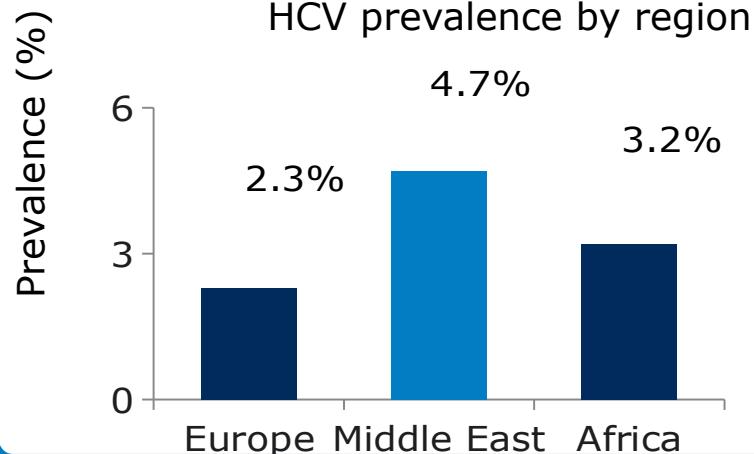


- Genotype 4: 12%-15% (15-18 Million) of total global HCV infection

# Global genotype distribution



EMEA has high hepatitis C/HCV type 1 and 4 prevalence, with IDUs, dialysis patients, and blood donors at high infection risk



Most common HCV genotype per region<sup>2</sup>

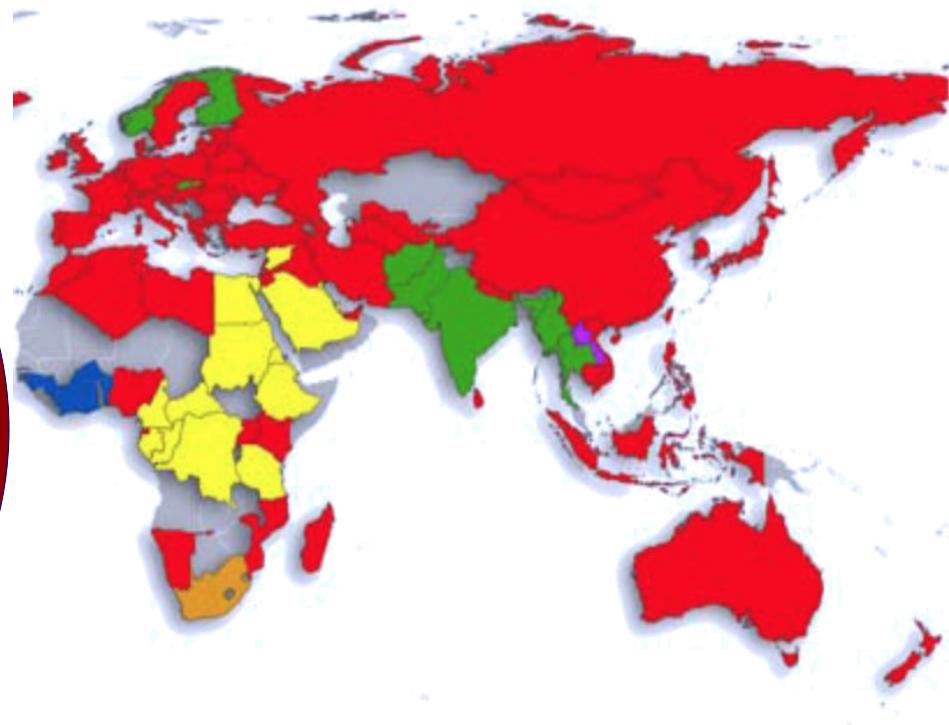
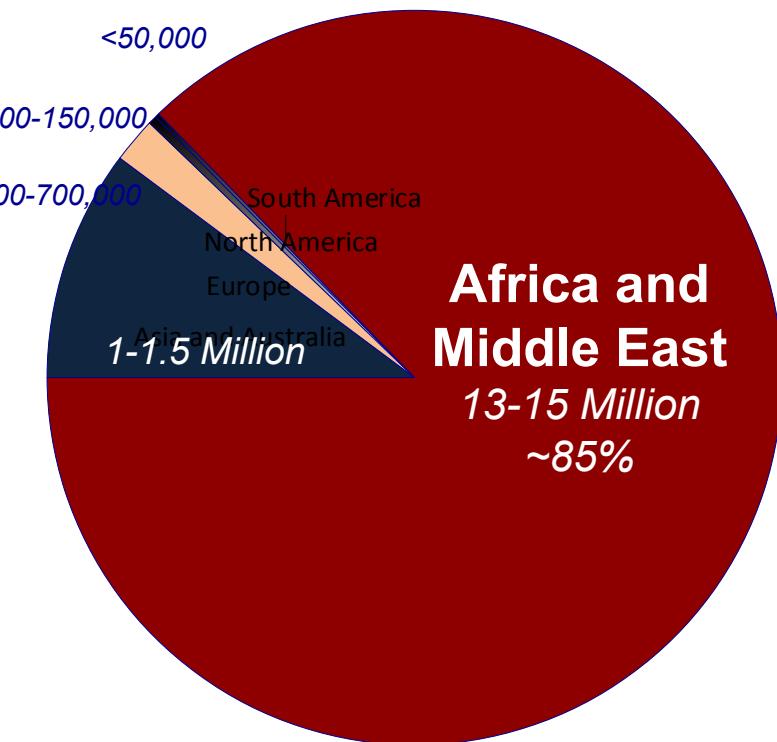
Region	Main risk factor(s) <sup>3</sup>	High-risk subgroups (HCV carriers) <sup>3</sup>
EU	IDU	IDUs & recipients of unsafe med procedures (migrants)
MENA	Transfusion/ Dialysis/IDU	IDUs, Donors & HCPs

1. Lavanchy D. Clin Microbiol Infect 2011;17:107–115; 2. Negro F, et al. Liver Int 2011;31(Suppl 2):1–3;

3. Daw M et al. Scientific World Journal 2012;2012:719494 (Epub)

# HCV Genotype Distribution Globally

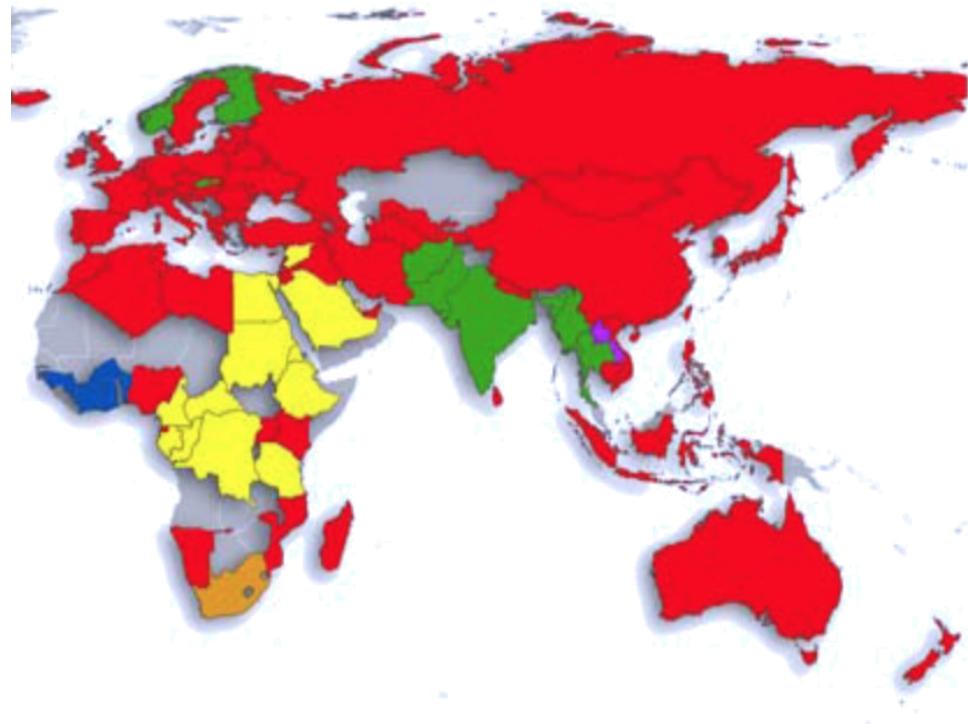
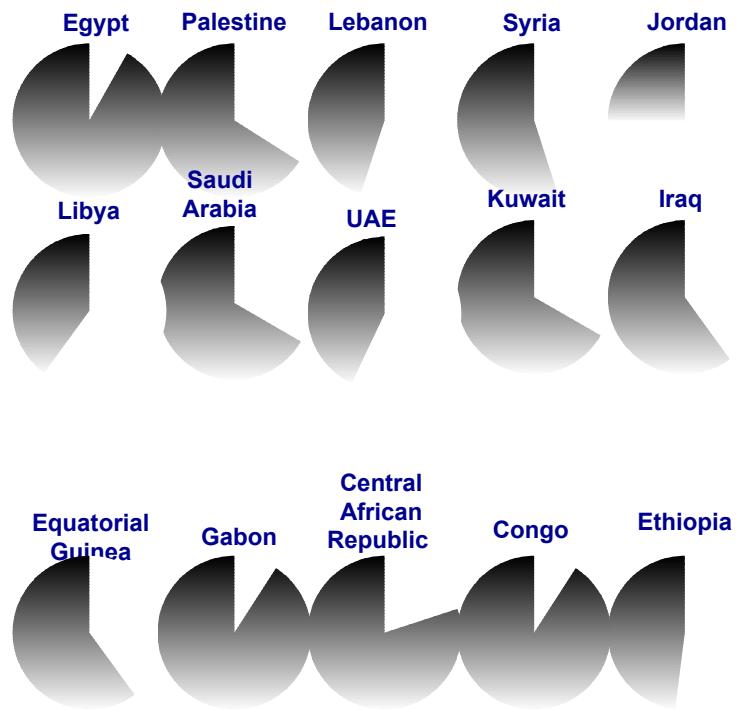
Global Total ~15-18 Million with HCV G4



1. Gower, E., et al., J Hepatol 2014; 61:S45–S57;

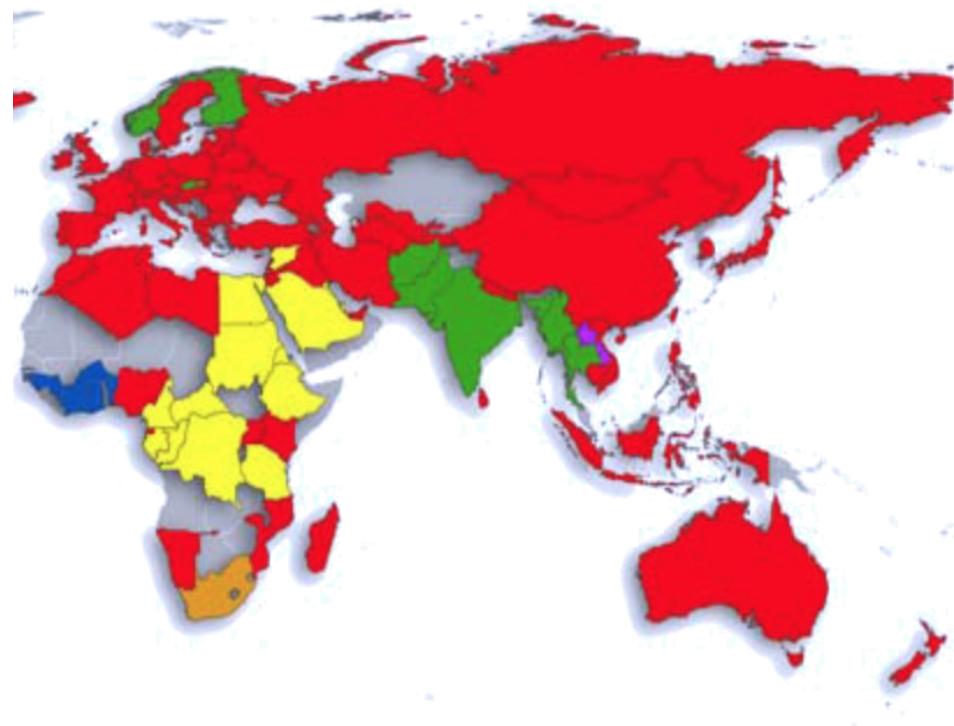
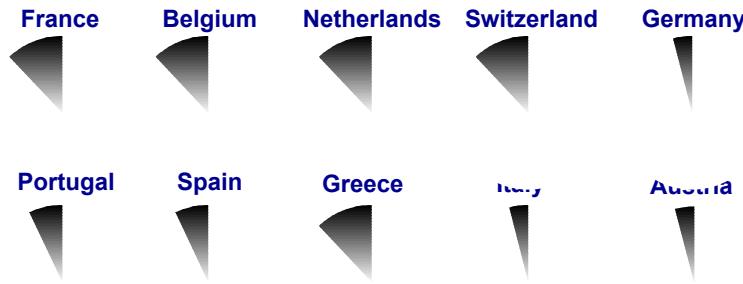
2. Messina J. et al. Hepatology, 2015;61:77-87

# Genotype 4 Distribution by Country Africa & Middle East



- G-4 is considered “endemic”, circulated for generations in restricted regions

# Genotype 4 Distribution by Country Europe, Asia, North and South America



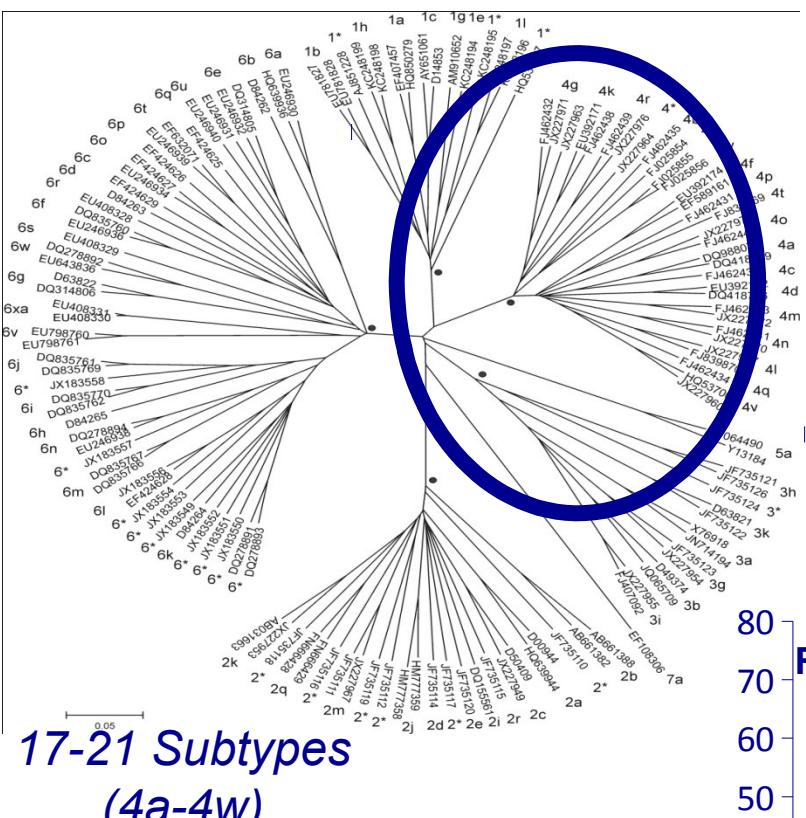
- HCV G-4 is increasing in Europe due to prevalence in PWID and migration
- Increasing in France (>10%), Spain (>15% in South Spain) and Italy

1. Gower, E., et al., J Hepatol 2014; 61:S45–S57;
2. Messina J. et al. Hepatology, 2015;61:77-87
3. Asselah et al. J Hepatol. 2012; 56:527-32;
4. Cifuentes C Et al. Enferm Infect Microbiol Clin 2012; 30:452-7;
5. Sariguzel et al. Clin Lab. 2013; 59:1403-8

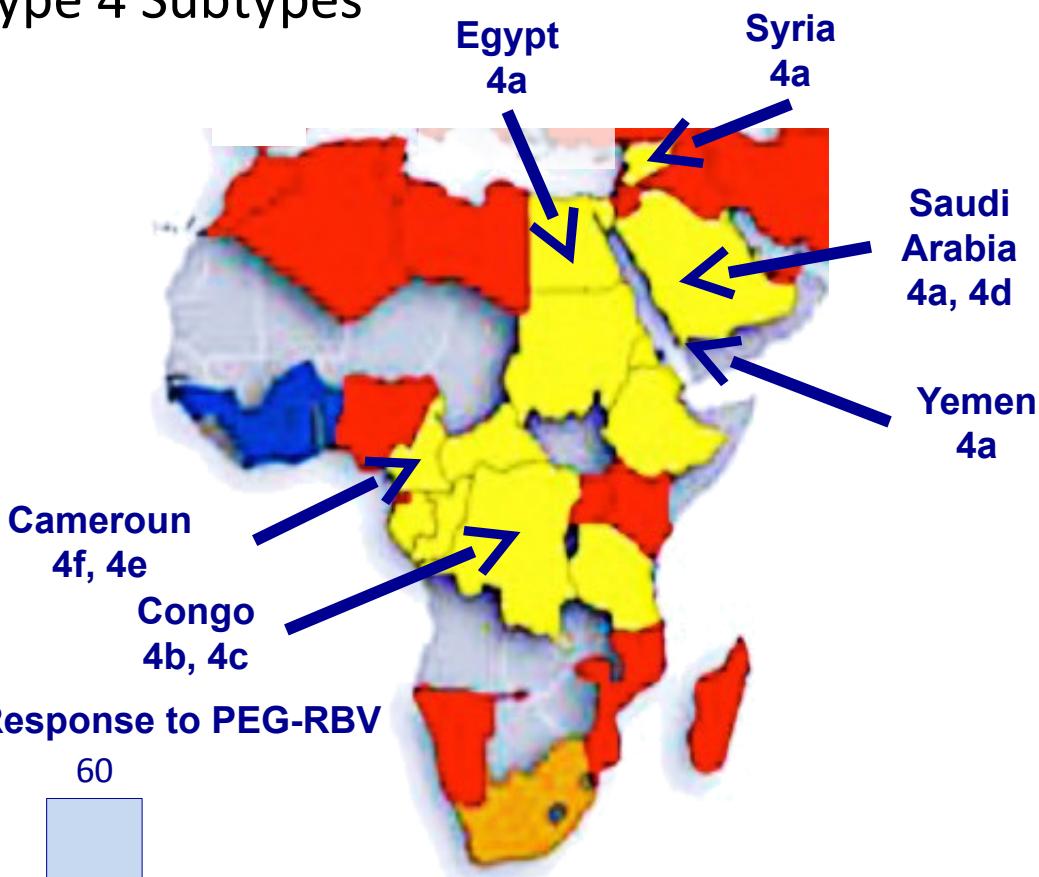
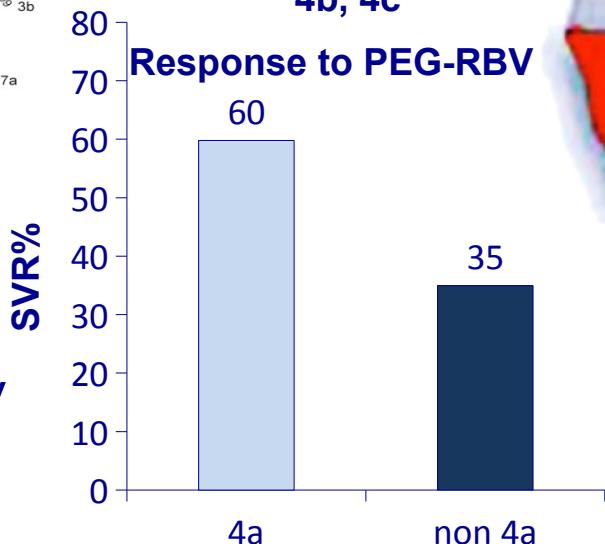
# Epidemiology of G4

HCV genotype 4 prevalence %	Country
91 %	Egypt
76 %	Cameroon
71 %	Gabon
60 %	Nigeria
60 %	Saudi Arabia
30 %	Lebanon
30 %	Syria
14 %	Southern Spain
7.4 %	Southwestern France
6.2 %	Southern India
3.6 %	Germany
3.1 %	Northern Italy
1.4 %	Southern Italy

# Genotype 4 Subtypes



- Subtypes responded differently to PEG-RBV therapy



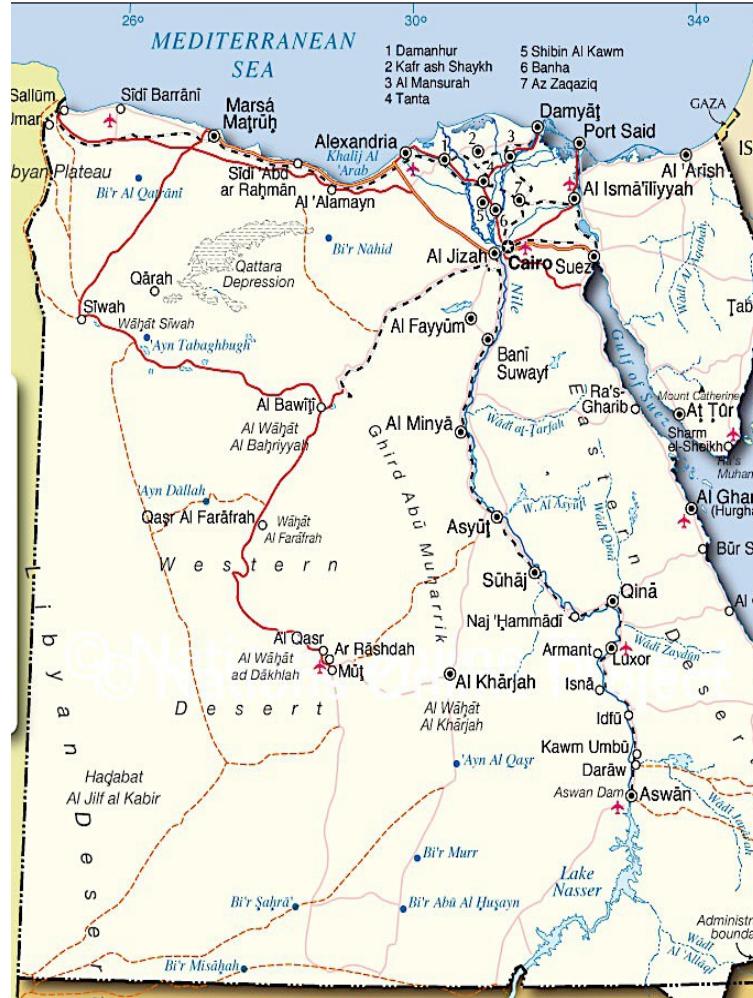
- Impact of G4 subtype on response to DAA still not known

1. Smith DB. et al. Hepatology. 2014;59:318-27. 2. Gower, E., et al., J Hepatol 2014; 61:S45–S57;

3. Messina J. et al. Hepatology, 2015;61:77-87 4. Roulot D et al. J Viral Hepat 2007 5. Moucari R et al. Gut 2009

# EGYPT

## 90 Million Population



# Egyptian National HCV surveys (1996&2008&2015)

# Survey Partners

- Under auspices of Ministry of Health.
- Implemented in association with DHS Egypt and MACRO international.
- Funding from USAID and UNICEF.
- Hepatitis C testing undertaken at the central Laboratory of MOH.

# Hepatitis C testing

- Household survey in 28 governorates.
- ELISA test used to determine presence of antibodies.
- Real time PCR testing for HCV RNA for all antibody positive samples to detect active infections.

## National Survey (DHS) 2015 (1 -59 years)

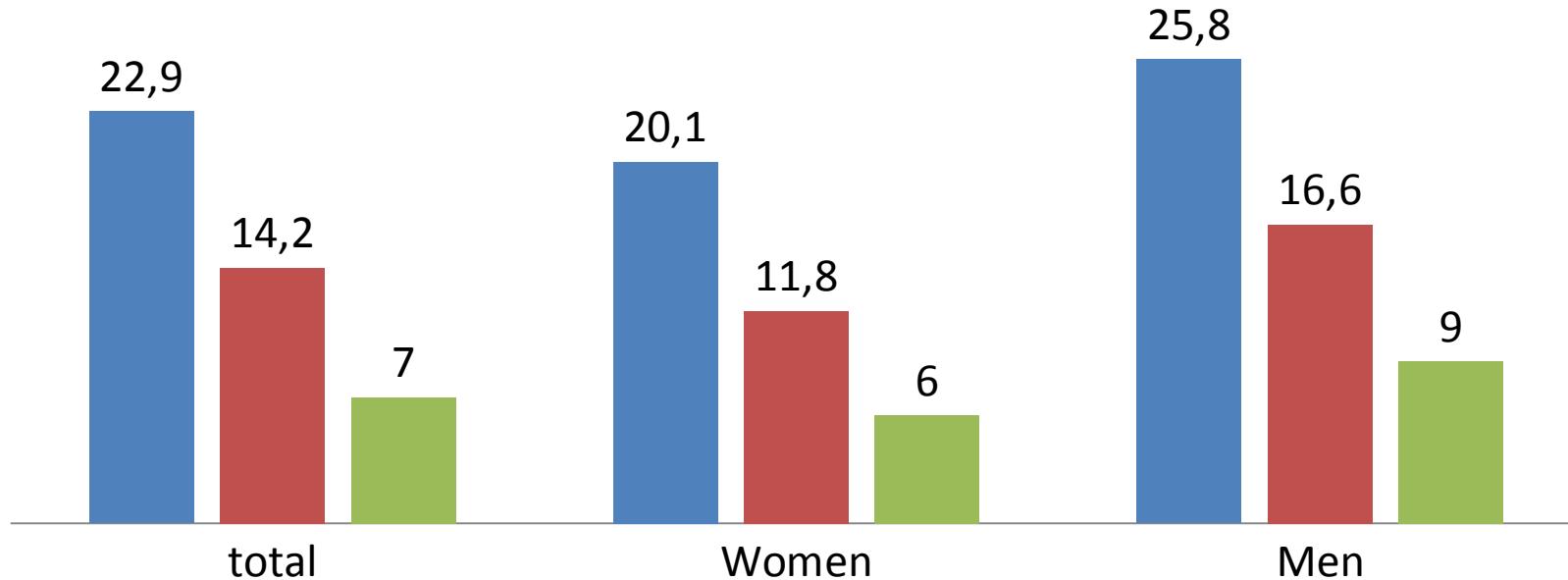
2015(1-59 Y) HCV Ab      6.3%

HCV PCR    4.4%

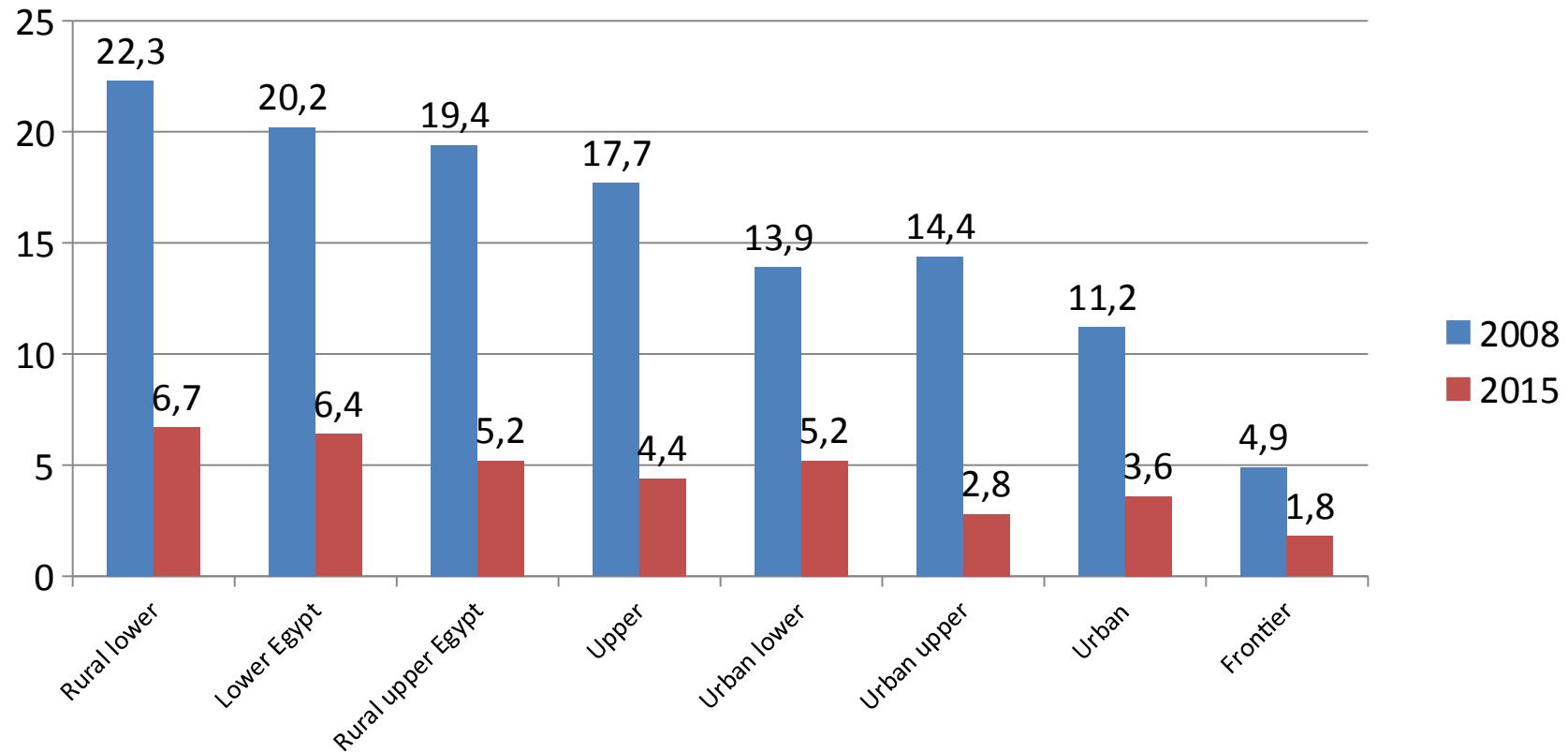
# Trends in Percentage of population age 15-59 testing positive HCV Ab, Egypt 1996-2008-2015

Chart Title

■ 1996 ■ 2008 ■ 2015

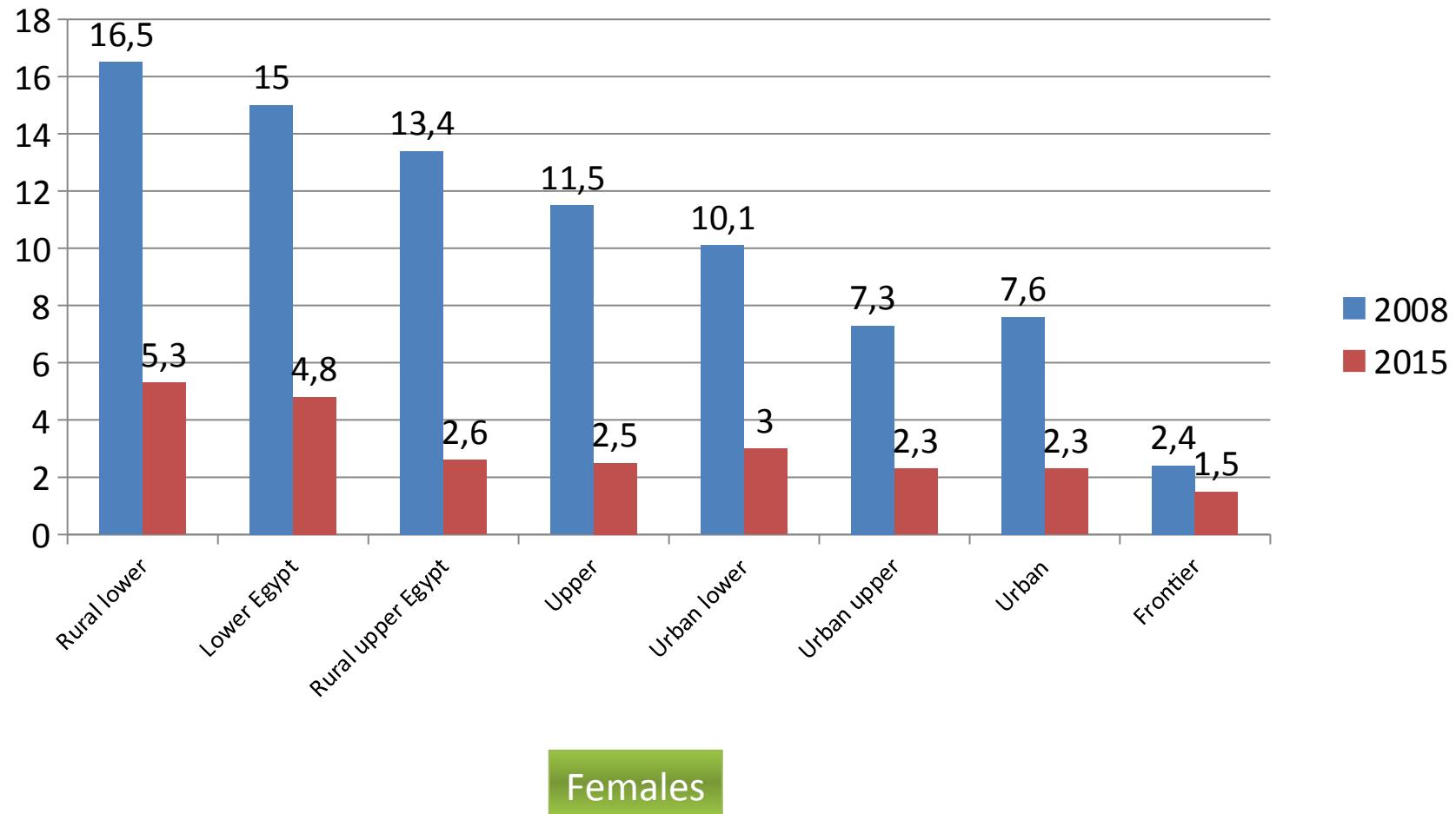


# Percentage of HCV infection (positive RNA) in different regions (2008-2015) Women

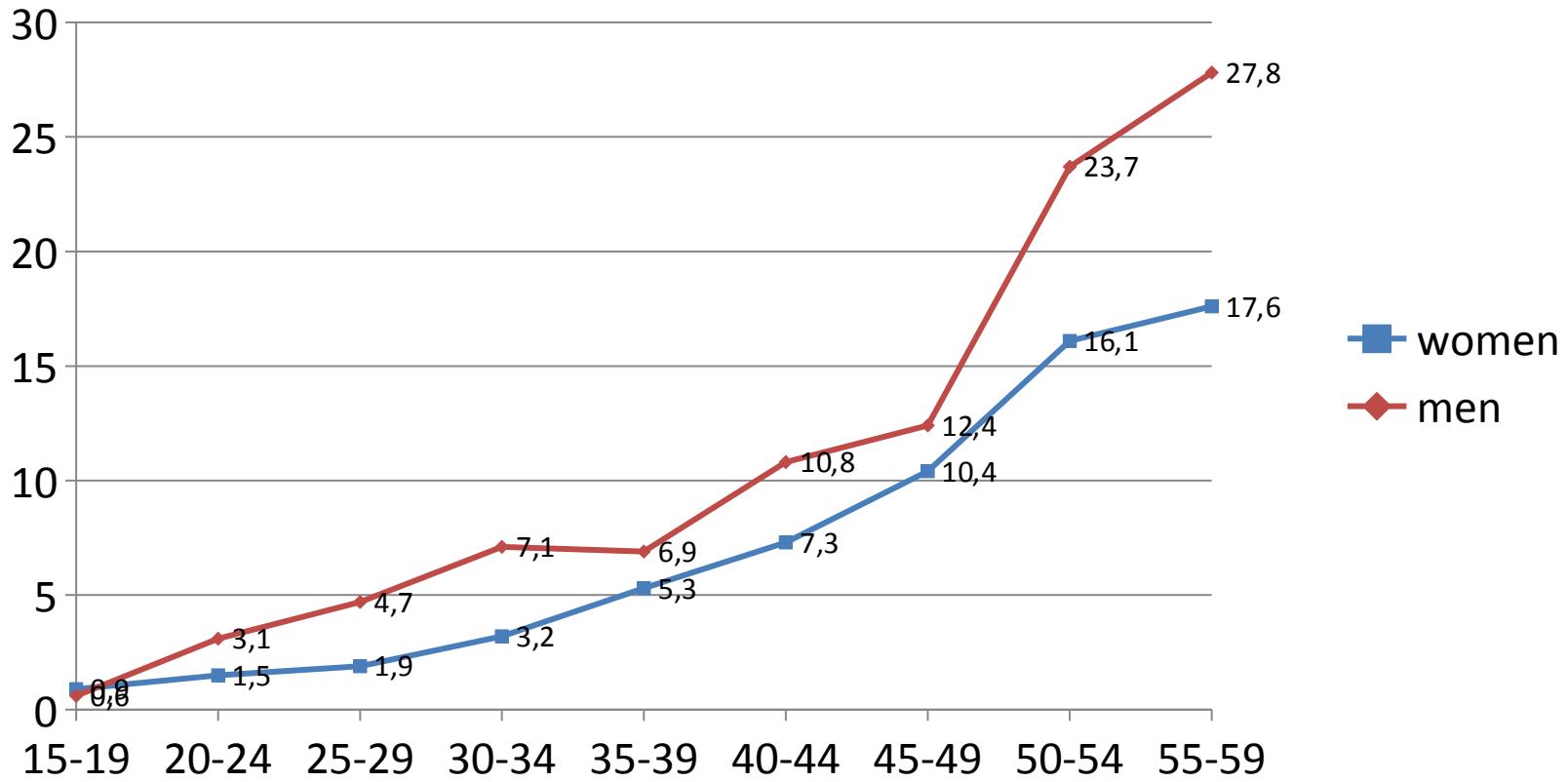


Males

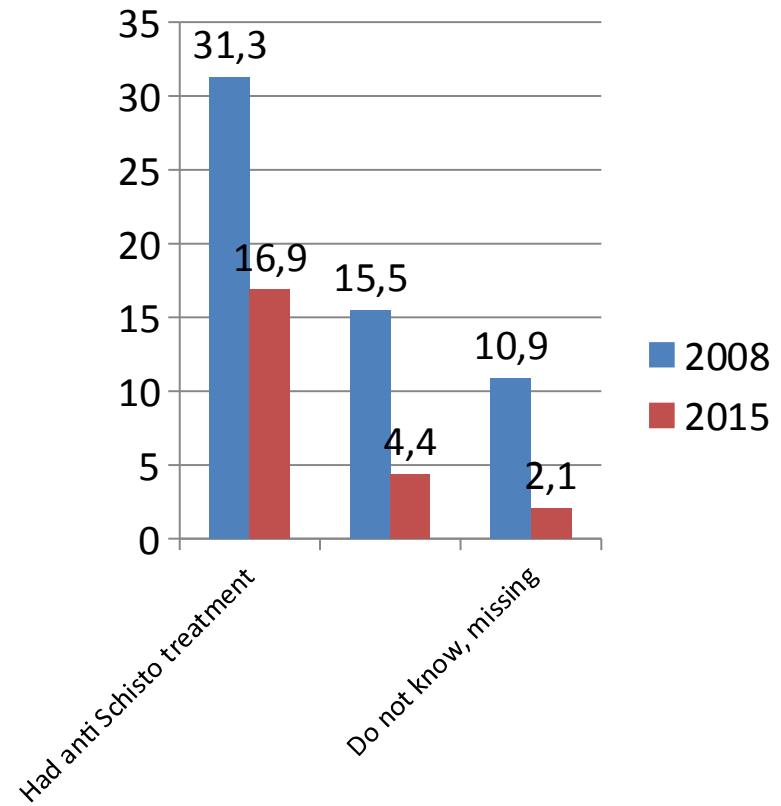
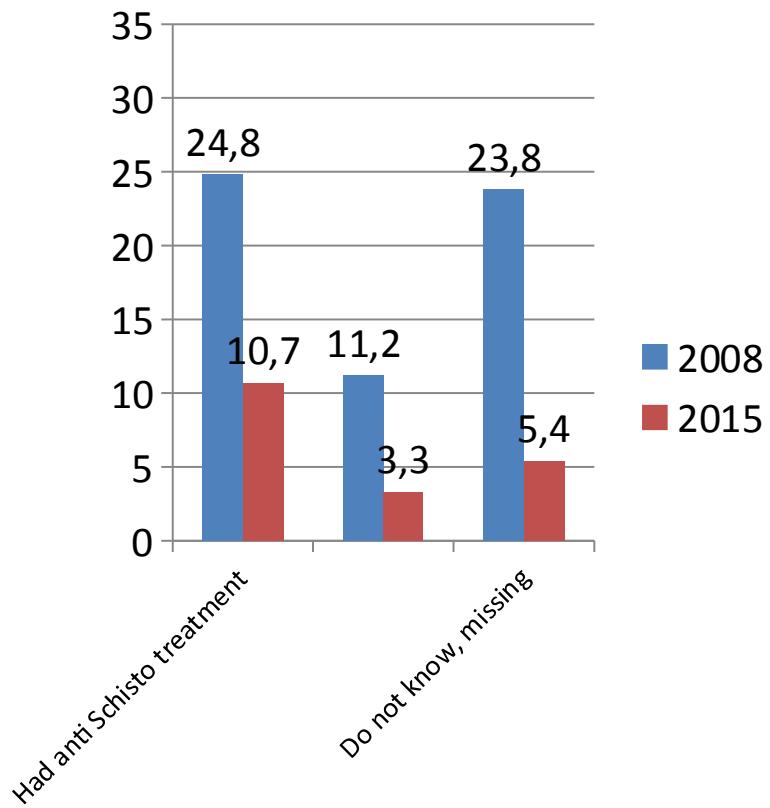
# Percentage of HCV infection (positive RNA) in different regions (2008-2015) Women



# Percentage of women and men with an active hepatitis C infection by age, Egypt 2015



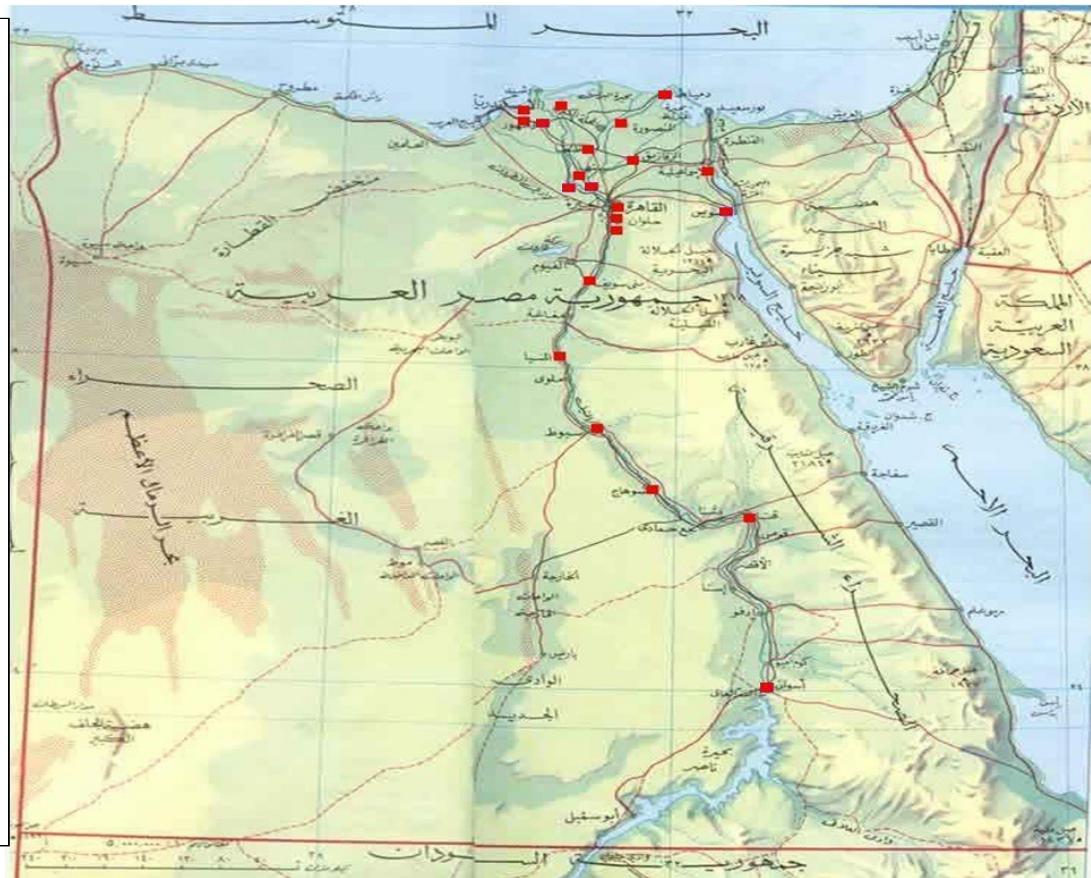
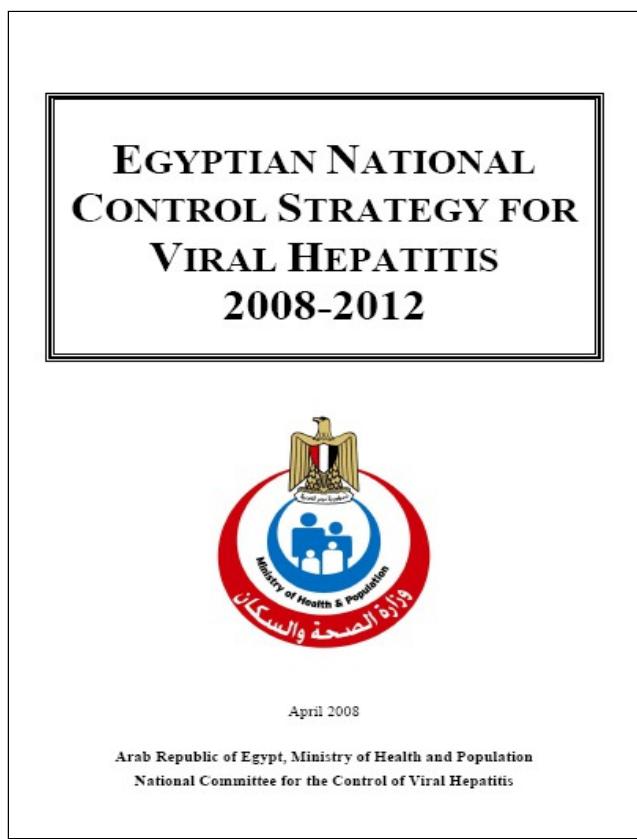
# Percentage of HCV infection with Anti Schistosomiasis treatment (2008-2015)



Females

Males

# Opening of 23 national treatment centres, 2007-2013



Total number of patients treated with PEG-IFN (2007-2013): 350,000

Annual number of new patients treated: 45,000

Annual budget from the Ministry of Health: 90 million \$

# National Plan of Action: conclusions



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**Plan of Action for the Prevention,  
Care & Treatment of Viral Hepatitis,  
Egypt  
2014-2018**

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Increase policymakers' commitment to supporting the policy change necessary to prevent viral hepatitis transmission.

Educate healthcare workers to prevent transmission of viral hepatitis in Egypt.

Increase public awareness of viral hepatitis prevention.

Promote safe injection practices in the community.

**Annual treatment of 200-350.000 patients by DAA.i n 46 centers in 2015 aiming to reach 100 centers by the end of 2016**

# Chronology of Treatment Protocols Implemented by the National Program

Date	Implmented Protocol	Inclusion criteria
2007-2014	PegIFN-RBV	F1-F3 patients
October 2014-May 2015	Sofosbuvir-PegIFN-RBV Sofosbuvir-RBV	F3,F4 IFN tolerant F3,F4 IFN intolerant up to Child B 8 (down to 7)
May 2015-November 2015	Sofosbuvir-PegIFN-RBV Sofosbuvir-Simeprevir	F0-F4, normal synthetic function F0-F4, impaired synthetic function up to Child A6
November 2015	IFN-free regimen. Two DAAAs ± RBV (mostly Sofo+Dacla)	F0-F4, impaired synthetic function up to B7. Higher Child in special centers

# Before DAAs Era

## IFN therapy (IFN/RBV) Non Cirrhotics

Week 48  
PCR results

**ETR**

Week 72  
PCR results

**SVR**

71%

62%

NR 949

NR 949

RS 2286

Negative PCR  
2016

Positive PCR  
270

SVR 2016

Relapser 270

till Nov 2015

# Triple therapy (IFN/SOF/RBV) 35%Cirrhotics

Week 12  
PCR results

**ETR**

Week 24  
PCR results

**SVR**

96%

92%

NR 188

NR 188

RS 4394

Negative PCR  
4197

SVR 4197

Positive PCR  
197

Relapser 197

till November 2015

# Dual therapy (SOF/RBV) 70% Cirrhotics

Week 24  
PCR results

**ETR**

98%

Week 36  
PCR results

**SVR**

72%

**NR 43**



**NR 43**

**RS 2584**

Negative PCR  
1888

**SVR 1888**

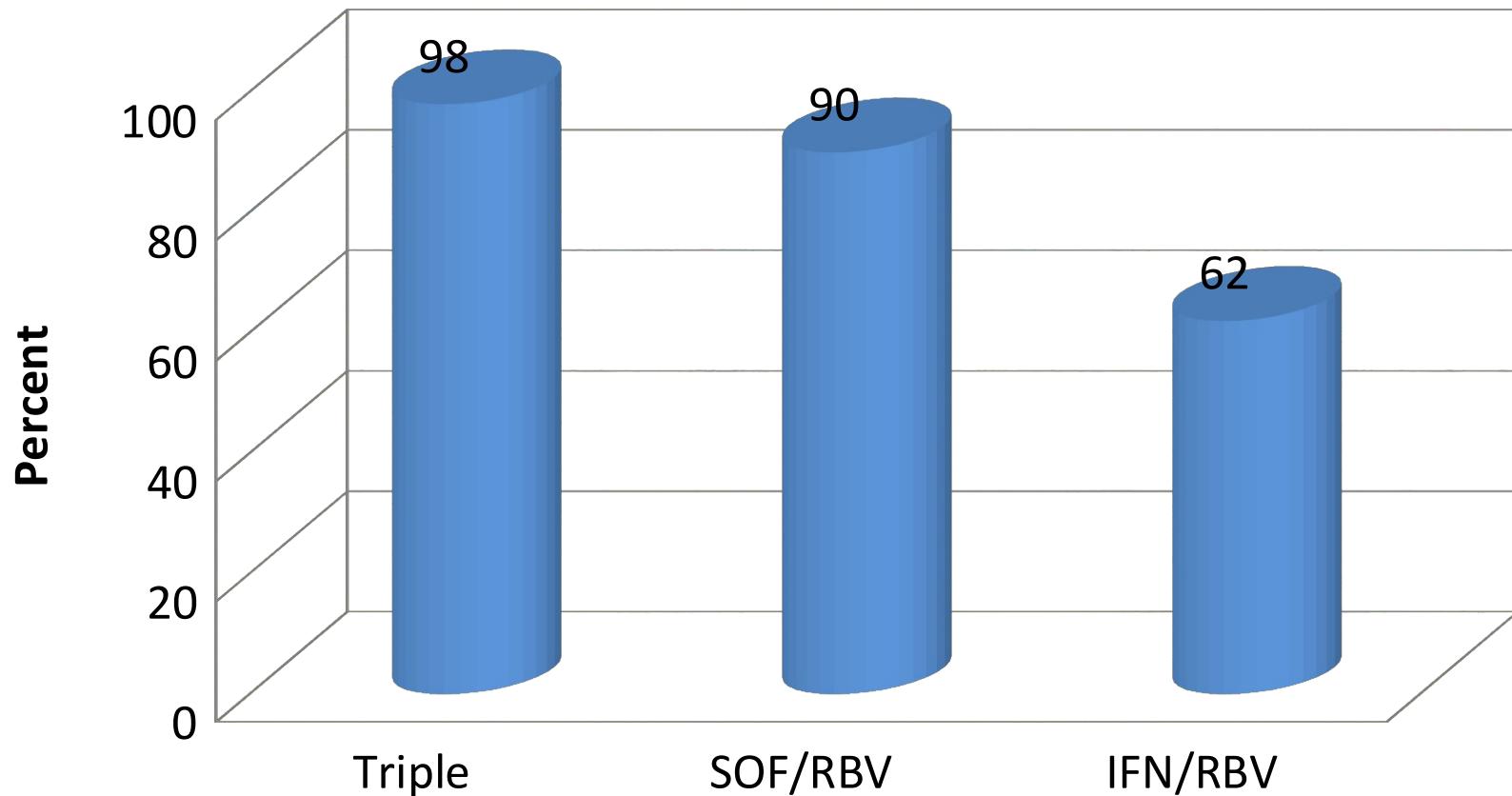
Positive PCR  
696

**Relapser 696**



# SVR in non Cirrhotics

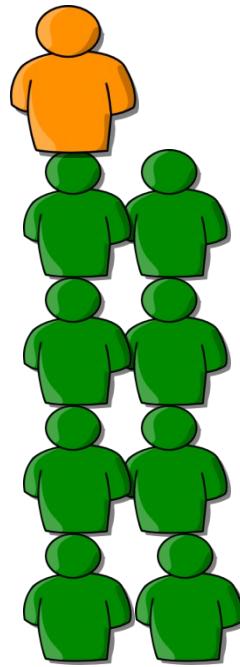
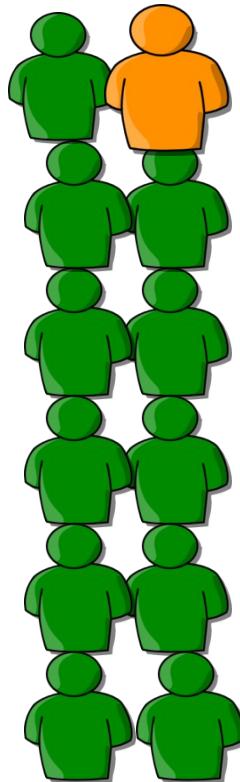
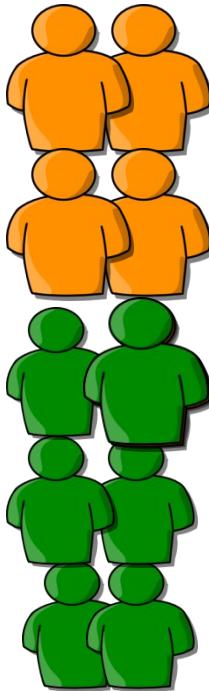
Fib-4 <1.45,



120,000 L.E

SVR %

# COST EFFECTIVENESS CHART



COST/PT

12,000 L.E

9600 L.E

12,600 L.E

# THANK YOU



Nile River in Cairo