

Hepatitis C Infection Elimination until 2030 International Experiences and National Plan

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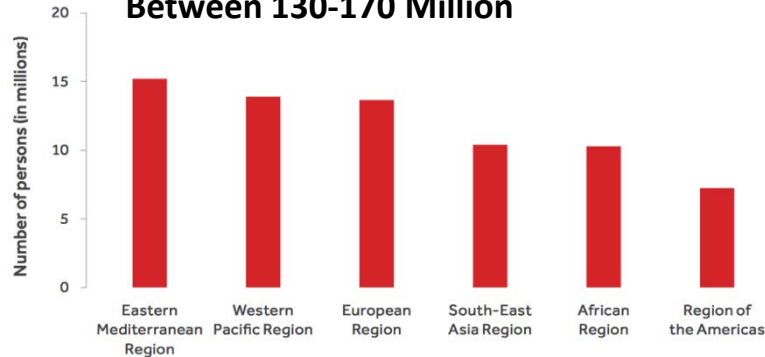
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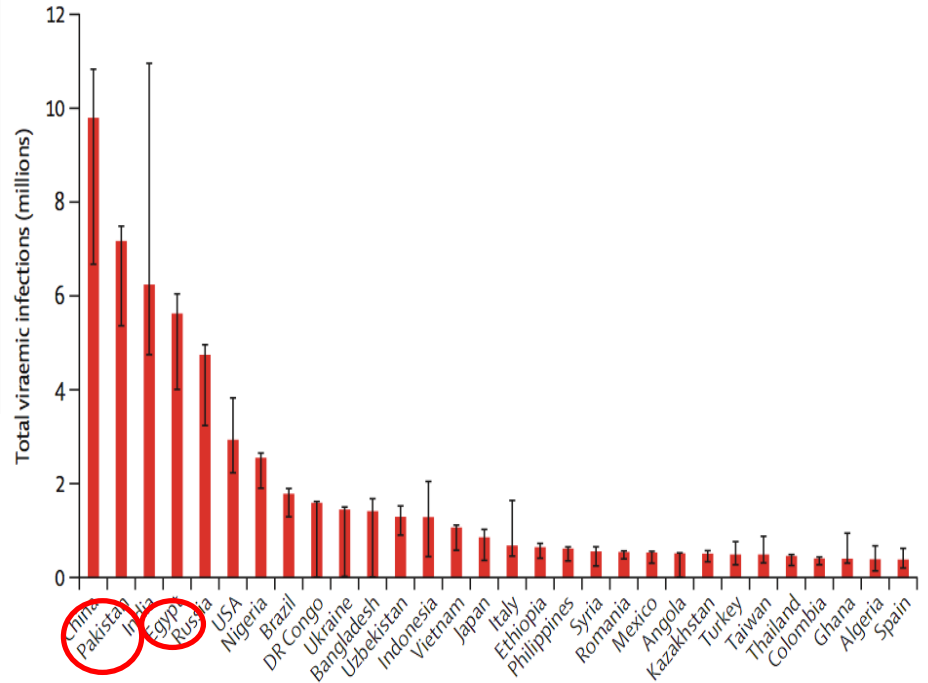
Prevalence of HCV Infection by WHO Region

WHO region	Estimates of the prevalence of HCV infection (%)			Estimated number of persons living with HCV (millions)		
	Best	Lower	Higher	Best	Lower	Higher
African Region	1.0	0.7	1.6	11	7	16
Region of the Americas	0.7	0.6	0.8	7	6	8
Eastern Mediterranean Region	2.3	1.9	2.4	15	13	15
European Region	1.5	1.2	1.5	14	11	14
South-East Asia Region	0.5	0.4	0.9	10	8	18
Western Pacific Region	0.7	0.6	0.8	14	10	15
Total	1.0	0.8	1.1	71	62	79

Previously reported Worldwide Infection: Between 130-170 Million

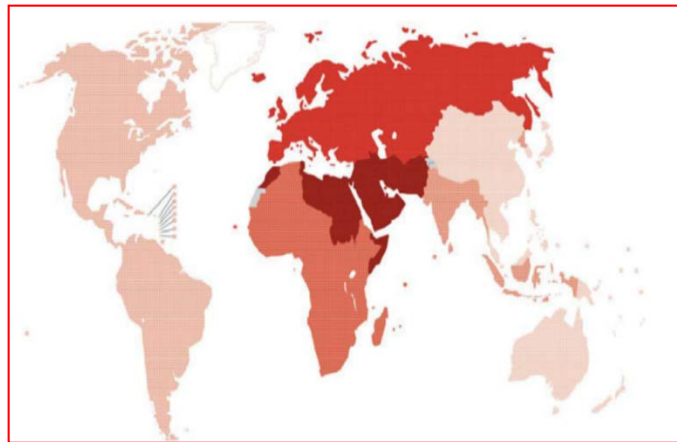


Global Prevalence of HCV by Country



Map of Incidence of HCV Infection by WHO Region/ Blood and Injection Safety

WHO region	Map key	Incidence of HCV infection			
		Incidence rate (per 100 000)		Total number (000)	
		Best estimate	Uncertainty interval	Best estimate	Uncertainty interval
African Region		31.0	22.5–54.4	309	222–544
Region of the Americas		6.4	5.9–7.0	63	59–69
Eastern Mediterranean Region		62.5	55.6–65.2	409	363–426
European Region		51.1	50.3–66.0	565	460–603
South-East Asia Region		14.1	12.5–26.9	287	243–524
Western Pacific Region		6.0	5.6–6.6	111	104–124
Global		23.7	21.3–28.7	1 751	1 572–2 120

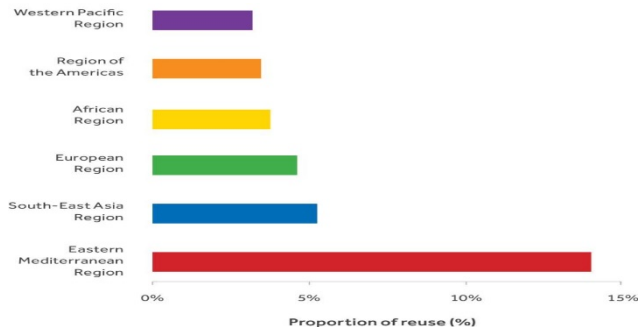


1,75 million new infections in 2015

Unsafe health care and injection drug use



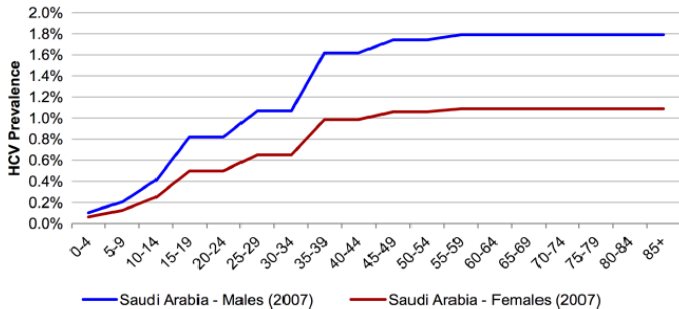
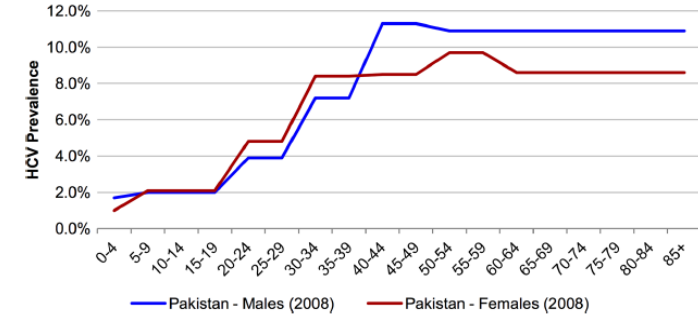
Proportion of unsafe injections by region, challenges remain particularly in the Eastern Mediterranean region



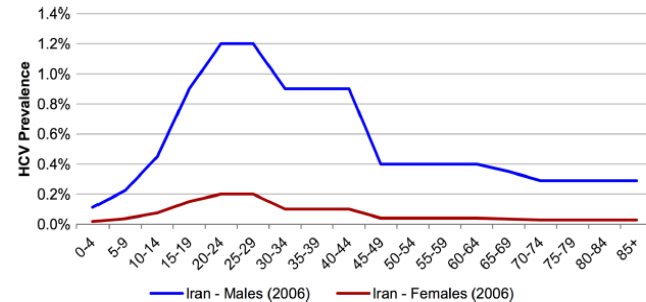


Younger HCV infected patients in Iran

Iran has one of the lowest rates of HCV prevalence in the Middle East.



Less than 0.4% in general population



Hepatitis C as a Neglected Disease

- NO Symptoms
- No effective treatment (before 2013!)
- Lack of knowledge (general population, healthcare workers and patients)

Hepatitis C in Iran

- First report in Iran is related to Rezvan et al in 1994 in IBTO: 0.3% of blood donors in Tehran.

The Main Risk factors

Transfusion, undergoing endoscopy, extramarital sexual activities, non intravenous (i.v.) drug abuse, **i.v. drug abuse**, and receiving wounds at **war** were found to be independent risk factors of being HCV-positive.

No apparent risk factors could be demonstrated in **24.5%** of the positive cases.

Table 3 Logistic regression analysis of risk factors

Risk factor	Odds ratio	95% CI
Extramarital sexual activities	42.2*	5.3–335.7
Being wounded at war	5.2*	1.2–21.9
History of undergoing endoscopy	4.0*	1.3–12.5
i.v. drug abuse	52.8*	6.8–412.0
Needle-stick	8.9	0.8–93.9
Non-i.v. drug abuse	34.4*	4.2–278.2
Transfusion history	17.0*	7.0–41.0

*Odds ratio is statistically significant. CI, confidence interval; i.v., intravenous.

0.12% were HCV positive

Epidemiologic profile and estimated disease burden of HCV in Iran in 2014

HCV epidemiology and burden	Frequency
Individuals living with chronic HCV infection	186,500 individuals
HCV prevalence (viremic)	0.24% (0.17% - 0.31%)
HCV incidence (annual)	11 per 100,000
HCV diagnosis	35%
HCV treatment rate (annual)	2.4% (n ~ 4,500)
HCV genotype	Genotype 1: 64% Genotype 2: 2% Genotype 3: 33% Genotype 4: 1%
Less than 0.5% HCV seropositivity	
HCV-related decompensated cirrhosis	140 individuals
HCV-related HCC	160 individuals
HCV-related death	120 individuals

Hajarizadeh B, Razavi-Shearer D, Merat S, **Alavian SM**, Malekzadeh R, Razavi H. Liver disease burden of hepatitis C virus infection in Iran and the potential impact of various treatment strategies on the disease burden. Hepatitis Monthly. 2016;16(7):e37234

In a study in three prisons in three central provinces of Iran (Isfahan, Lorestan, Chaharmahal va Bakhtiari) in 2003 in male prisoners who were arrested because of their addiction

- 3.5% were HBs Ag positive and 35.8% were HCV antibody.
- According the age, the infection with HBV and HCV were more common in younger than 30 yrs. old.
- Isfahan , Lorestan and Chaharmahal va Bakhtiari: Addicted arrested respectively, 28.5%, 50% , 53.% HCV infected
- IUDs, Tattooing history, In jail more than 5 years were important
- **In Conclusion:** Potentiating of harm reduction program ,Education for dangerous behavior,

جدول ۲- توزیع فراوانی آلودگی به ویروس HCV به تفکیک سال در زندان‌های بررسی شده در کشور

سال بررسی	آلودگی به ویروس HCV		
	حجم نمونه	درصد آلودگی	95%CI
۱۳۷۹	۴۸۰	۲۴/۰	۲۰/۳-۲۷/۹
۱۳۸۰	۲۳۴۶	۳۴/۷	۳۲/۷-۳۶/۶
۱۳۸۱	۱۷۶۲	۴۴/۸	۴۲/۵-۴۷/۱
۱۳۸۲	۱۵۹۷	۴۶/۱	۴۴/۲-۴۹/۱
۱۳۸۳	۲۴۰۰	۳۲/۸	۳۰/۹-۳۴/۶
۱۳۸۴	۴۵	۴۲/۲	۲۸/۵-۵۶/۹
جمع	۸۶۳۰	۳۷/۸۵	۳۶/۸-۳۸/۹



High risk group



30 December 2017 Zahedan

In 50 IDUs cases we had 9 cases with HCV positive and 2 cases with HIV

Undiagnosed cases



Hepatitis C Virus Infection and Its Prevalence in Iran

- Less than 0.5% of General population are HCV infected in Iran and the main risk factors are **history of blood transfusion before 1996** and **history of IDUs**
- The special group such as **Hemophilia** and **Thalassemia** and **Hemodialysis** patients selected for screening and treatment during recent 10 years and now..
- IDUs cases are the main high risk group now and harm reduction and other strategies should attenuated now.
- Treatment is a part of prevention for decrease the chance of transmission

2011-2014

- Revolutionized treatment
- Direct Acting Antivirals (DAAs)
- No injections
- Once daily
- Minimum side effects
- Highly effective

Central elements for HCV elimination



Increase screening and diagnosis



Increase uptake of effective treatment



Expanded models of HCV management



Political leadership



National HCV strategies



Policy change

- Generic DAA is a major step forward but there are still more requirements to ensure achieving WHO HCV elimination targets:
 - o Affordable HCV diagnosis and treatment with access for all
 - o Expanding prescribers
 - o Integration of substance use care and HCV care
 - o HCV awareness campaigns targeting the main population at risk
 - o Peer-workers can facilitates linkage to care
 - o Simplified diagnostics

At Risk Populations

- People who inject drugs (PWID)
- Prisoners
- Thalassemia and Hemophilia patients
- Hemodialysis
- Transfusion history before 1375
- People with war and motor vehicle injuries
- Sex workers
- HIV infected people
- Sanitation workers
- First degree relatives of HCV infected people
- Medical and healthcare workers
- Organ transplant receivers
- Newborns of HCV infected mothers



Who are at high risk and we should focus on them now!

✓ Those who received blood and blood products before 1996

✓ **So** What is the role of government now for HCV elimination?



Testing with Continuum of Care

Who to test?

How to test?

How to confirm
current/viraemic
infection?

Monitoring
treatment
response

Who to test

How to test
(anti-HCV
antibody)

Confirmation
of viraemic HCV
infection (HCV
RNA or cAg)

Assessment
of HCV treatment
response
(test of cure)



Who to Test?

Who to test?

- ✓ Blood donors
- ✓ Individuals with history of high-risk behaviors (PWIDs, FSW, etc.)
- ✓ Inmates
- ✓ Hemophilia, thalassemia and leprosy
- ✓ HIV infection
- ✓ Patients on Hemodialysis.

Who to test



Who to Test?

Who to test?

Who to test

**Populations most
affected by HCV**



General Population



WHO Recommendation:

In settings with a $\geq 2\%$ seroprevalence of HCV Ab Elisa, it is recommended that all adults have routine access to and be offered testing.



How to Test?

How to test?

- HCV Ab Eliza for screening of HCV infection.

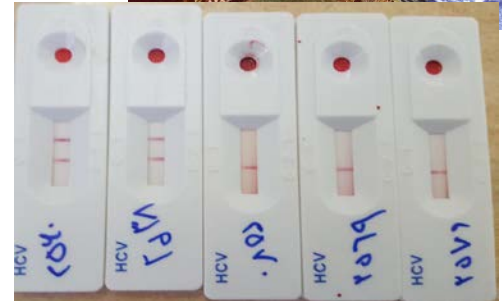
How to test
(anti-HCV
antibody)

- Methods
 - Laboratory-based immunoassay
 - Rapid diagnostic test



Rapid Diagnostic Test (RDT)

- Can be used at the site of patient care
 - Prison
 - DIC, MMT, VCT
 - Rural areas
- Can use original specimen matrices in addition to serum and plasma
 - Oral fluid
 - Finger stick whole blood





How to Confirm Active Infection?

– to guide who to treat or not treat

**How to confirm
current/viraemic
infection?**

- ✓ Tests needed:
- HCV RNA by RT-PCR



**Confirmation
of viraemic HCV
infection (HCV
RNA or cAg)**

- HCV genotyping
- ALT/AST
- CBC



- ✓ To Diagnose:
- HCV current infection
- 
- HCV genotype
 - Cirrhosis (by FibroScan, APRI or FIB-4)

HCV Viral Load or Qualitative RT-PCR?

HCV Viral load in era of
IFN-based Regimens

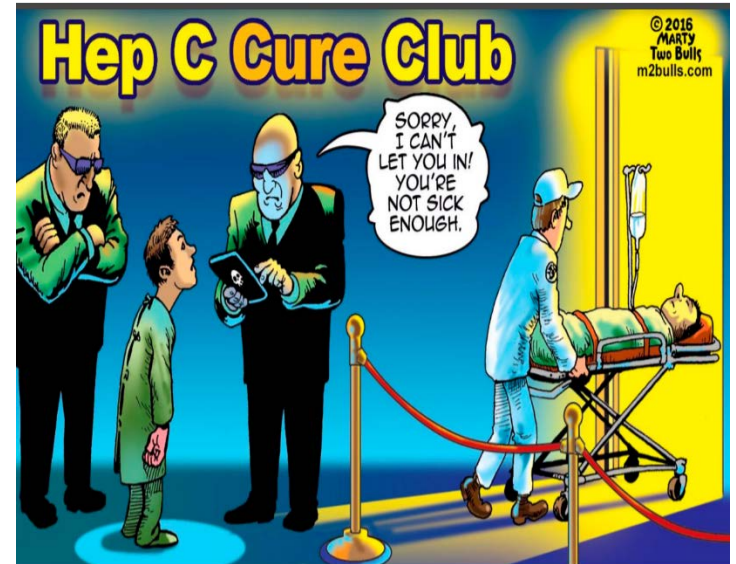
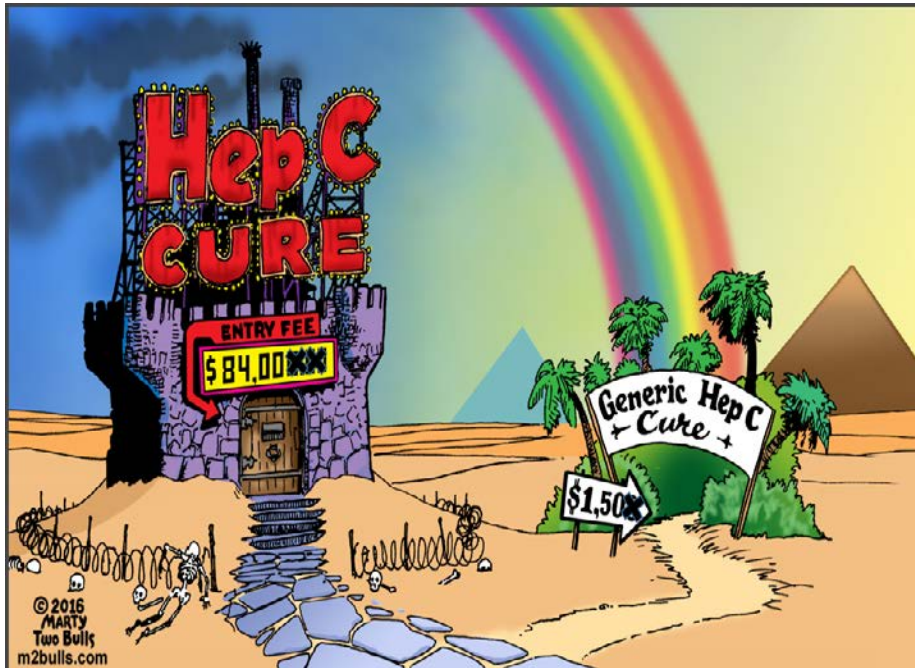


An important virologic marker
for shortening, elongation and
termination of treatment

HCV Viral load in era of
DAA-based Regimens

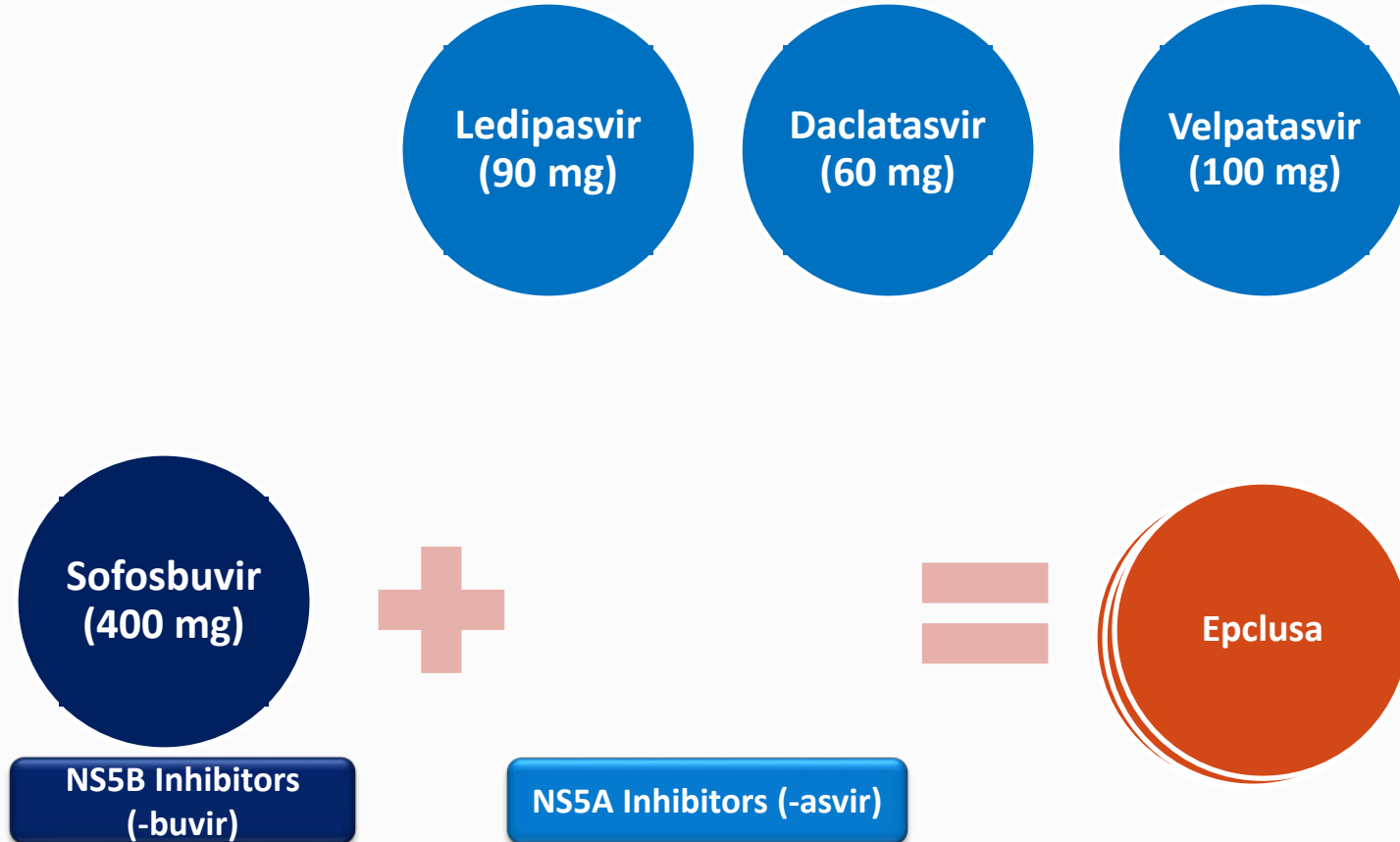


Has no role in clinical
decision making





Combination of NS5B and NS5A Inhibitors



Algorithm for Diagnosis and Monitoring

TREATMENT ASSESSMENT

HCV RNA NU
(qualitative or

ASSESSMENT OF STAGE OF LIVER DISEASE (using clinical criteria³ and non-invasive tests (NITs), i.e. APRI score⁴ >2 or based on TE⁵)

OTHER CONSIDERATIONS FOR TREATMENT (e.g. comorbidities, HCV genotyping, pregnancy and potential drug-drug interactions)

HCV RNA
Rep
(with vira

Compatible with

SELECT DIRECT-ACTING ANTIVIRAL (DAA) REGIMEN^{1,6}

Daclatasvir/sofosbuvir or ledipasvir/sofosbuvir ± ribavirin for 12 or 24 weeks (depending on genotype and presence of cirrhosis)

HCV RNA test or cAg -
Report not detected

No current viraemic HCV

HCV Genotyping; Yes or No?

HCV genotyping in era of **IFN-based** Regimens



Used for determination of
treatment duration.

HCV genotyping in era of **DAA-based** Regimens



Used for determination of the
treatment combination (the regimen
± RBV) and treatment duration.

HCV RNA Assessment

- HCV RNA detection (qualitative) should be tested before initiation of treatment and 12 or 24 weeks after treatment completion. SVR12 and SVR24 are 99% concordance.
- HCV RNA detection should be made by a reliable sensitive assay.

Algorithm for Diagnosis and Monitoring

MONITORING

ASSESSMENT OF STAGE OF LIVER DISEASE (using clinical criteria³ and non-invasive tests (NITs) i.e. APRI)

ASSESSMENT OF CURE (sustained virological response (SVR) at 12 weeks (i.e. SVR12) after the end of treatment)
HCV RNA NAT (qualitative or quantitative)

FOR TREATMENT (e.g. comorbidities,

DETECTION OF HCC in persons with cirrhosis (every 6 months)
Ultrasound and AFP

SELECT DIRECT-ACTING ANTIVIRAL (DAA) REGIMEN^{1,6}

Daclatasvir/sofosbuvir or ledipasvir/sofosbuvir ± ribavirin for 12 or 24 weeks (depending on genotype and presence of cirrhosis)

WHO Objectives and Iran

1. Prevention

- A.** Increasing information in general and priority populations
- B.** Improving blood safety
- C.** Harm reduction

2. Diagnosis

- A.** Strengthening the national laboratory system
- B.** Screening priority populations
- C.** Improving point of care diagnosis

3. Treatment

- A.** Expanding treatment
- B.** Implement appropriate models of care
- C.** Providing chronic care

↳ Delivering for equity

- A.** Strengthening human resources
- B.** Ensuring access to good quality and affordable hepatitis medicines and diagnostics
- C.** Promoting an enabling environment

HCV Elimination Programs in Iran

- Prison-based programs
 - 10% HCV-seropositive
 - 35%-50% HCV-seropositive in inmates of addiction
- Community-based programs in high-risk groups
 - Including PWIDs, FSW and non-IV drug users
 - 10%-50% HCV-seropositive

HCV Elimination Programs in Iran

- Thalassemia and hemophilia
 - Less than 100 case need treatment
- Chronic kidney disease
 - Around 5% HCV-seropositive
- Other groups
 - People with history of blood transfusion before 1996
 - People with war injury
 - People with history of leprosy

HCV in Hemophilia and Thalassemia is on control in Iran now How?



Iran Hepatitis Network



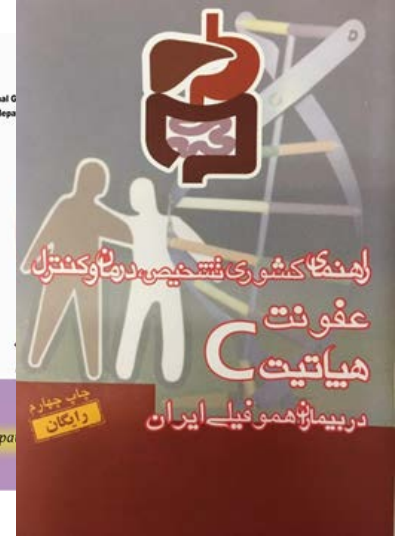
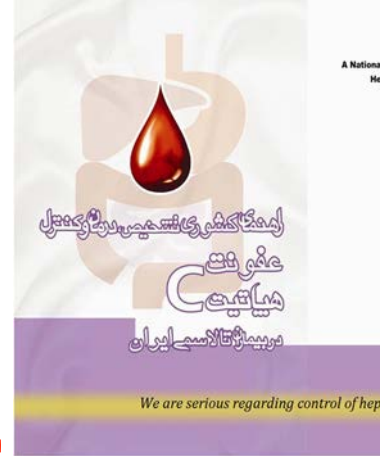
Ministry of Health and
Medical Education (Iran)



کانون هموفیلی ایران
حامی بیماران هموفیلی ایران



انجمن تالاسمی ایران



I hope for HCV elimination
until 2020 in special patients

Elimination of HCV in Hemophilia is a model for hemodialysis , but who is responsible!!



Generic DAA is available in Iran





Elimination will be possible by 2030 in Iran



While increasing efficacy has moderate declines in all HCV-related indicators, an aggressive treatment strategy would eliminate HCV in Iran, bringing the viremic prevalence to approximately **0.02%** by **2030**.

Increase treatment by **5000** individuals every year starting in **2016** until reaching a maximum treatment of **20 500** in **2018**. By treating over **20 000** individuals annually for **5 years**, the treatment could then decrease to below current levels by 2030.

Due to the large numbers of individuals being treated, there would need to be an increase in diagnosis rate to keep pace with the treatment rate. Utilizing a risk factors approach could make diagnosis, treatment and thus **elimination, a real possibility in Iran**.

- برای ریشه کنی هپاتیت سی تا سال ۱۴۱۰ نیاز است تا:
- (۱) تشخیص سریع، ساده و ارزان در دسترس همگان قرار گیرد.
- (۲) غربالگری وسیع، بخصوص در گروه های پرخطر (زندانیان، معتادین تزریقی، کودکان کار با رفتارهای جنسی پرخطر، افراد دارای سابقه دریافت خون و فرآورده های خونی قبل ۱۳۷۵ و...) انجام شود.
- (۳) موارد مثبت، شناسایی و درمان شوند.
- (۴) داروهای ارزان در دسترس تمامی موارد شناسایی شده باشد.
- (۵) به گایدلاین های بومی درمان هپاتیت سی توجه بیشتری شود.
- (۶) گایدلاین های درمانی در اختیار متخصصین داخلی و حتی پزشکان عمومی قرار داده شود و پیگیری درمان بیماران، به سطوح پایین تر (پزشکان عمومی) سپرده شود.
- (۷) هزینه درمان رایگان سالانه حداقل ۲۰ هزار بیمار مبتلا به هپاتیت سی، توسط دولت تامین گردد.
- (۸) آگاهی عمومی، نسبت به این بیماری افزایش یابد، تا از انتقال فرد به فرد جلوگیری شود.
- (۹) راهکارهایی جهت کاهش ریسک ابتلا، در افراد گروه پرخطر در نظر گرفته شود.
- (۱۰) جلوگیری از ابتلای مجدد پس از درمان هپاتیت سی، در گروه های پرخطر بخصوص معتادین تزریقی.
- (۱۱) آگاهی پزشکان و همکاران دیگر گروه پزشکی نسبت به برنامه ی جهانی ریشه کنی هپاتیت های ویروسی (Nohep)افزایش یابد.
- (۱۲) نظام جمع آوری اطلاعات دقیق ایجاد شود، تا تعداد موارد تشخیص داده شده و درمان شده در آن ثبت شود.
- ما پزشکان، پرستاران، ماماها، متخصصین علوم آزمایشگاهی و... تعهد می نماییم در راه رسیدن به این هدف بزرگ گام برداریم.





Increase General Awareness About HCV

- ✓ Fifth, the **media** should be used to **increase general awareness about HCV infection** and help the process of identifying patients with HCV infection
- ✓ In **Iran**, we have established a nongovernmental organization, **Hope Health Club** to increase knowledge in the general population about viral hepatitis.
- ✓ www.hopehealthclub.com



Distributing books and brochures



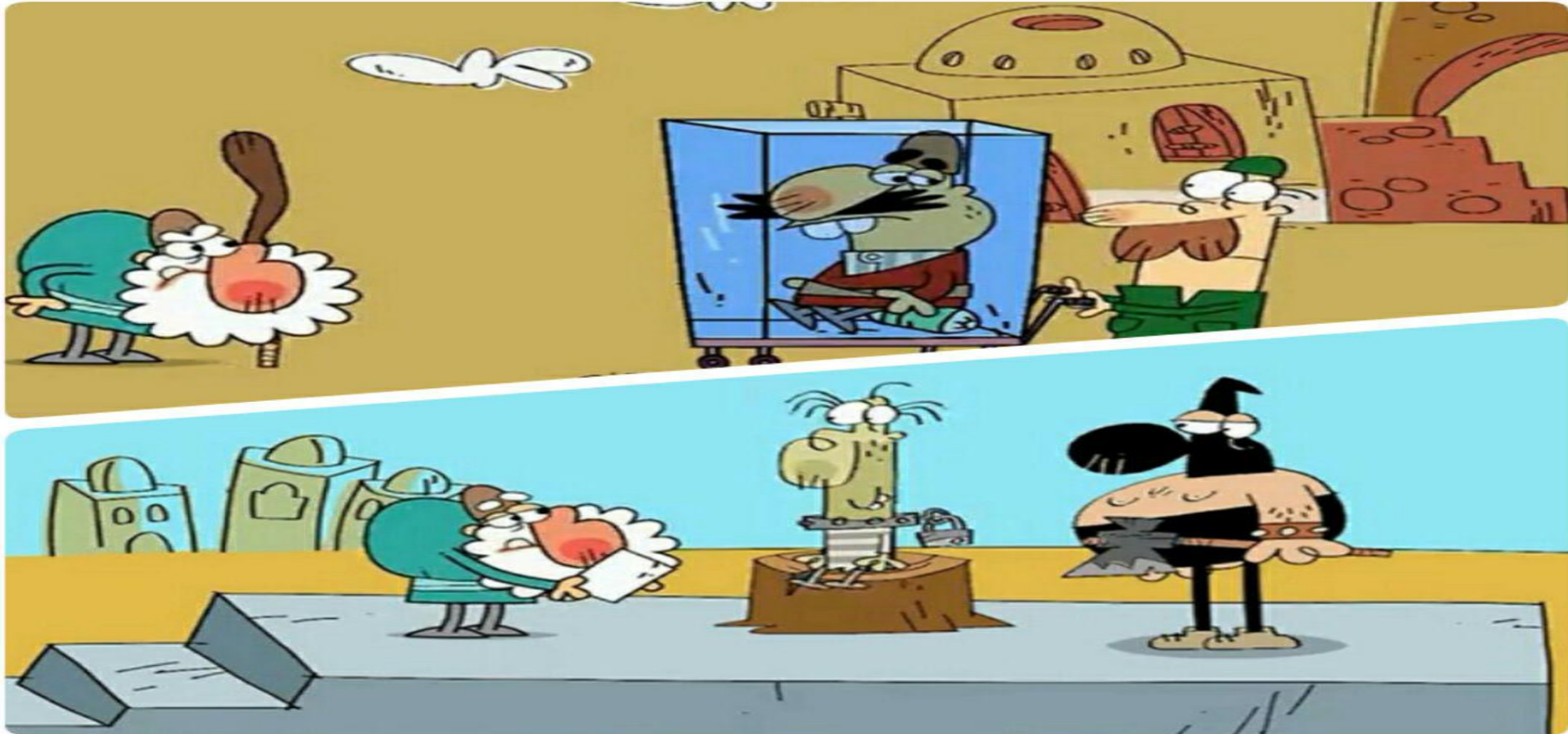
Face to Face Training



Health ambassadors



Animations



Iran Connected NOhep Program

worldhepatitisday.org/en/supporters

About WHD 2016 Photos Map of impact Campaign supporters Campaign materials About hepatitis English

CAMPAIGN SUPPORTERS

The following organisations are supporting the World Hepatitis Day campaign.

If you would like to add the support of your organisation please submit your organisation details and logo using the link below.

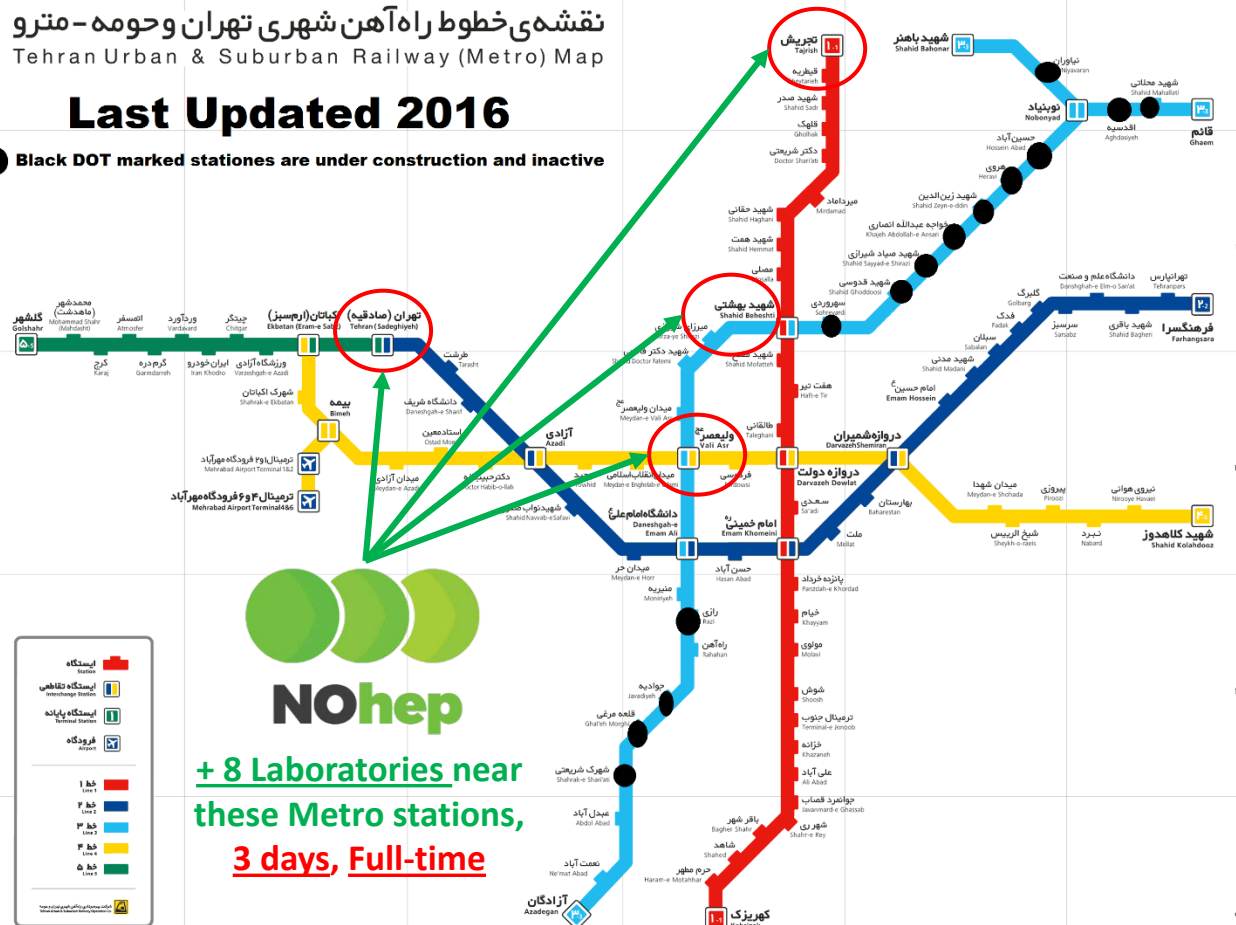
[Add your support](#)



نقشه‌ی خطوط راه‌آهن شهری تهران و حومه - مترو Tehran Urban & Suburban Railway (Metro) Map

Last Updated 2016

● Black DOT marked stations are under construction and inactive



+ 8 Laboratories near
these Metro stations,
3 days, Full-time



Materials for 1st Iran Hepatitis Awareness Campaign
Iran Hepatitis Network, Tehran, Iran







International Feedbacks



RETWEETS 6 LIKES 6

3:33 PM - 23 Oct 2016

#nohep



AASLDnews

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ove the trea
throughout the

LOWING
593



NOhep... @NO_hep - 2h
Want to send us a #SaturdaySelfie from where you are? Be sure to include the

Want to send us a #SaturdaySelfie from where you are? Be sure to include the
Check out this one from #Iran! #NOhepGoesGlobal





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Indexing Sources

Hepatitis Monthly is indexed/listed in: ISI Web of Sciences, PubMed Central; more...

Journal Metrics

	IF	SNIP	SJR	P	Rejection Rate
	1.932	0.76	0.444	158	64.8%

Current Issue: 16(12), Dec 2016

Review Article

Liver illness and Psychiatric Patients

► Paul Carrier, Marlène Debette-Griben, Murielle Girard, Jérémie Jacques, Philippe Nubukpol, Véronique Loustaud-Ratti

Cited by: CrossRef (0) | Scopus (0)

Molecular Tracing of Hepatitis C Virus Genotype 1 Isolates in Iran: A N5SB Phylogenetic Analysis with Systematic Review

► Khashayar Hesamizadeh, Seyed Moayed Alavian, Azar Najafi Tineh Shabankareh, Heidar Sharafi

Cited by: CrossRef (0) | Scopus (0)



Elimination of HCV infection in Iran will be in 2030 but in thalassemia and hemophilia is possible in 2020!



✓
Solution



Wo

More support for therapy

More attention to blood safety

More education the nurses in thalassemia centers Increase the thalassemia patients awareness regarding the issue.