

Hepatitis C Summit
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Hepatitis C Burden in the Central California Valley

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Goals

- Current prevalence and future projections of chronic liver disease in the US
- Barriers for HCV prevention and therapy
- Risk factors for transmission
- The data from the local studies looking at HCV burden in the Valley
- Current issues and future strategies

Chronic Hepatitis C

#1 cause for cirrhosis, liver cancer & liver transplant

After exposure 85% develop chronic infection; 20% will develop cirrhosis in 20 yrs.

Reduces life expectancy by 8-12 years

Two-thirds age 46-64 years



2-3 X in African Americans

~70% still undiagnosed

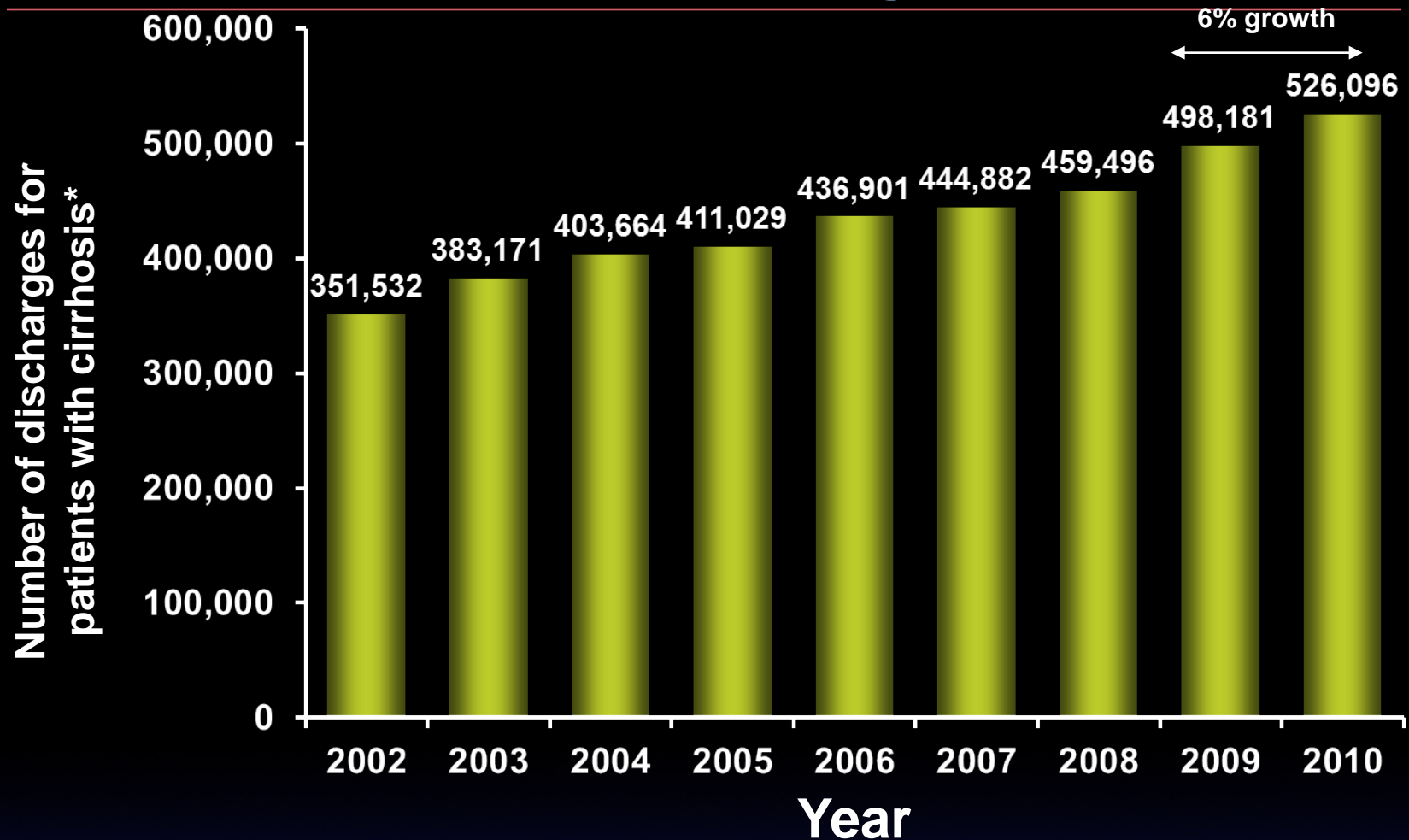
Annual medical cost 30 Billion

Less than 1/4th receive treatment

Kills 12,000 every year

*Chak E, et al. Hepatitis C virus infection in USA: an estimate of true prevalence. Liver International 2011; 1478-3223; 1090

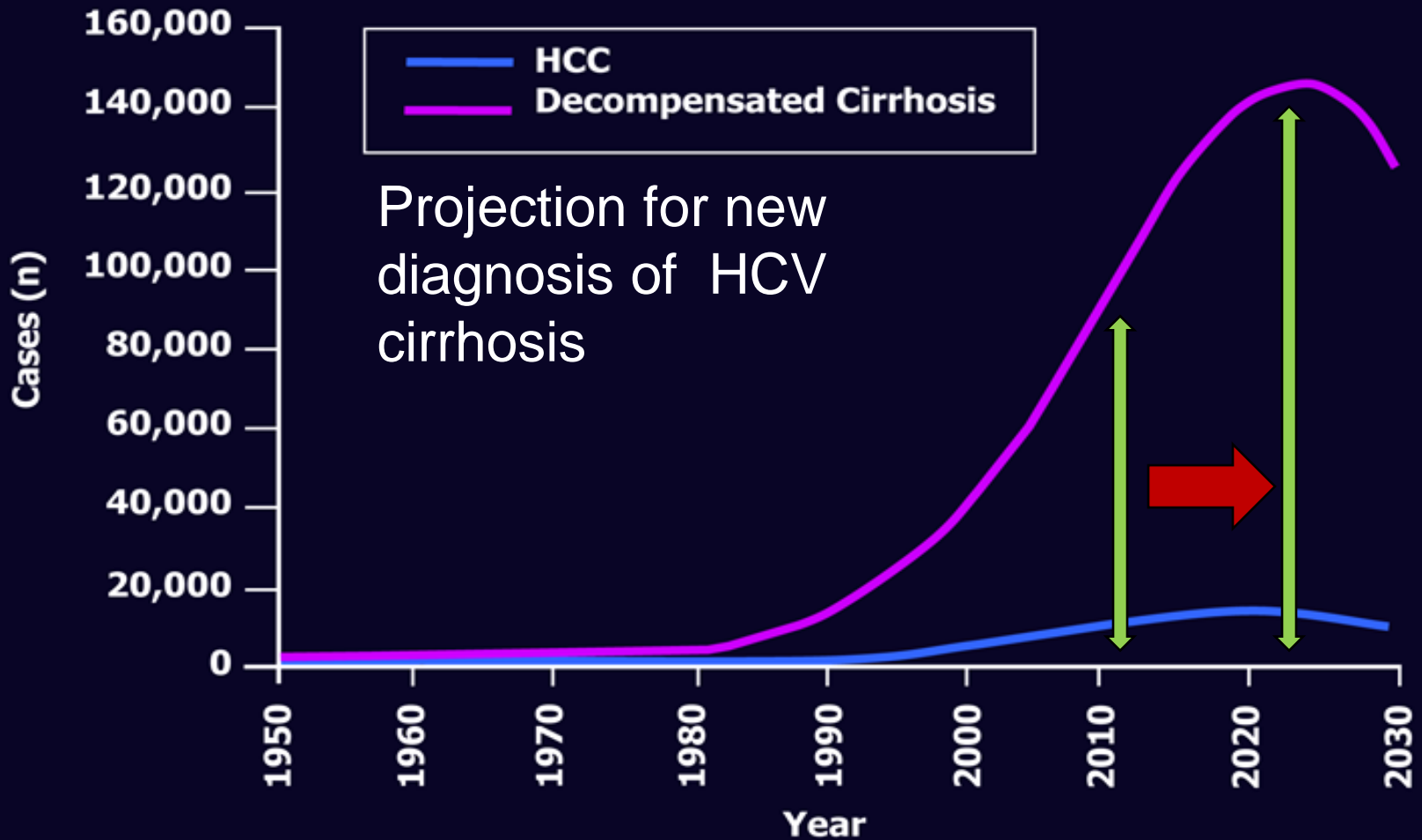
Hospital Discharges Coded to Cirrhosis is Increasing



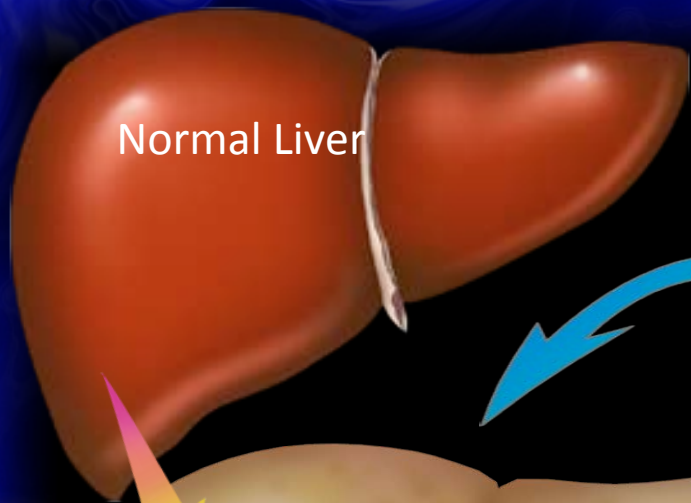
*ICD-9-CM diagnosis codes 571.2, 571.5, 571.6; all listed diagnoses.

HCUPnet, Healthcare Cost and Utilization Project. Agency for Healthcare Research and Quality, Rockville, MD. <http://hcupnet.ahrq.gov>. Accessed May 28th, 2012.

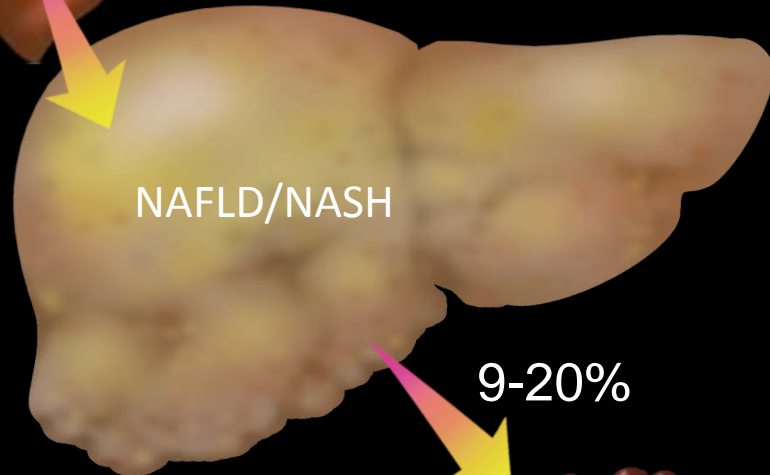
HCV-Decompensated Cirrhosis and HCC is Expected to Rise During This Decade



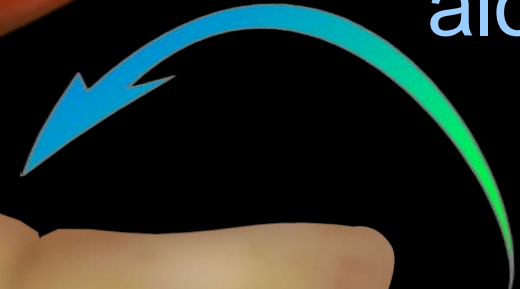
New players adding burden to the community along with HCV



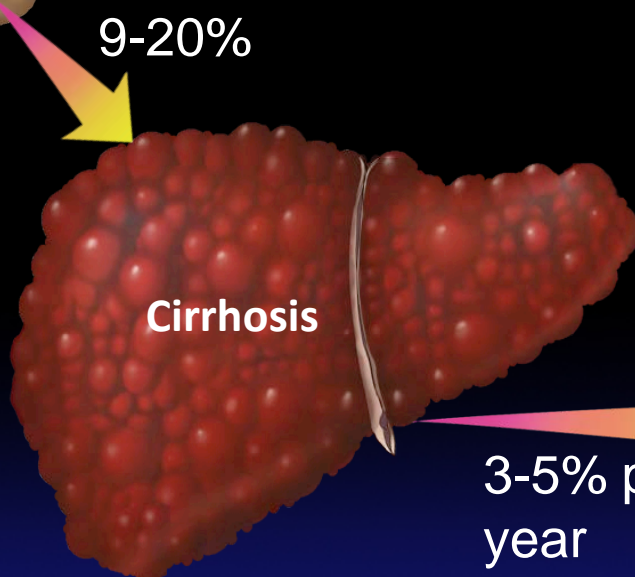
Normal Liver



NAFLD/NASH

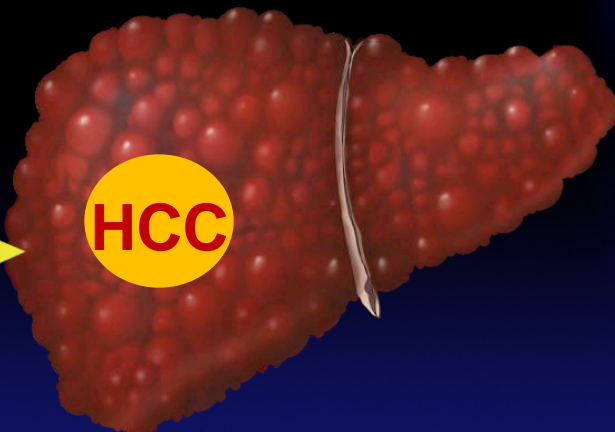


US Population
~25% NAFLD
3-6% NASH



Cirrhosis

9-20%



HCC

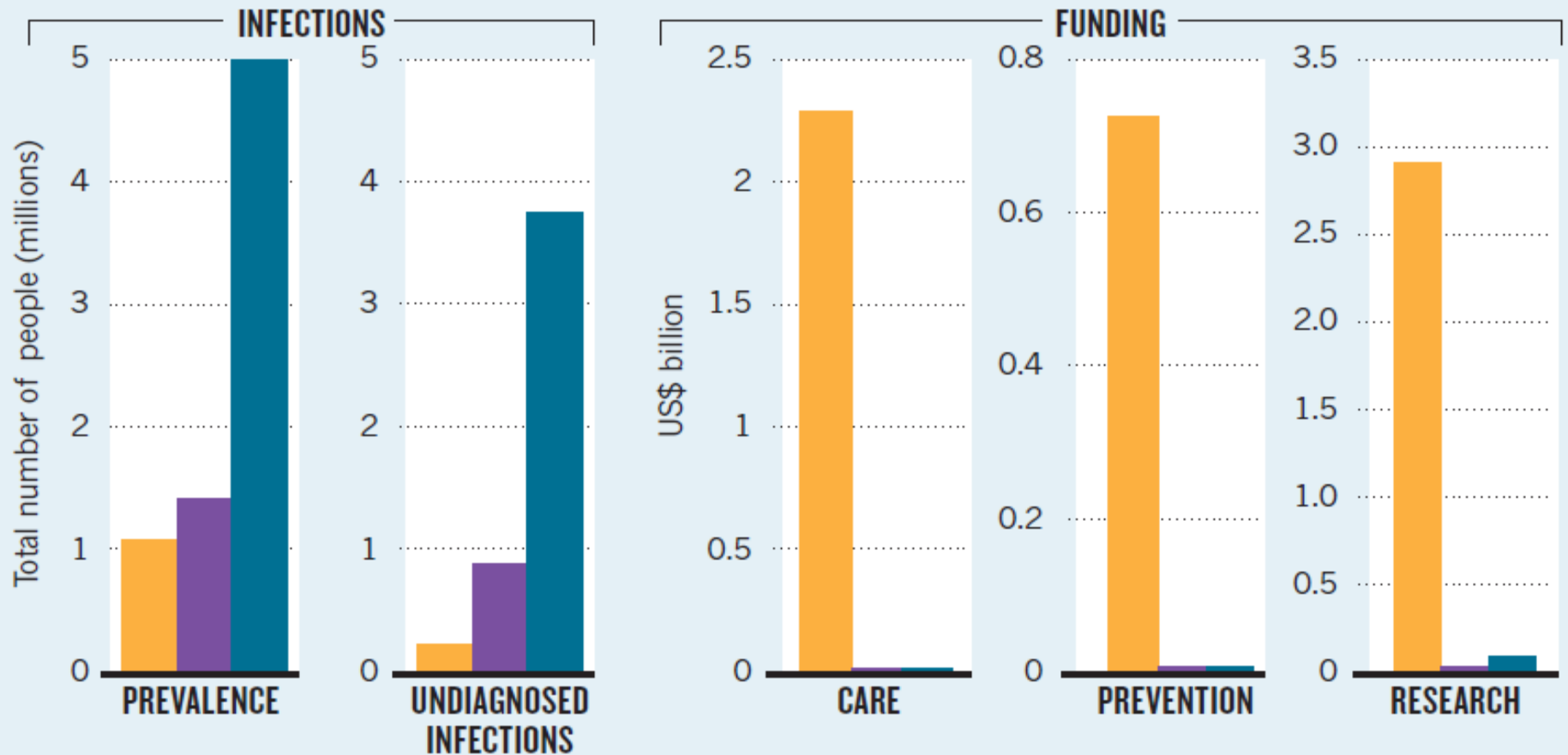
3-5% per year



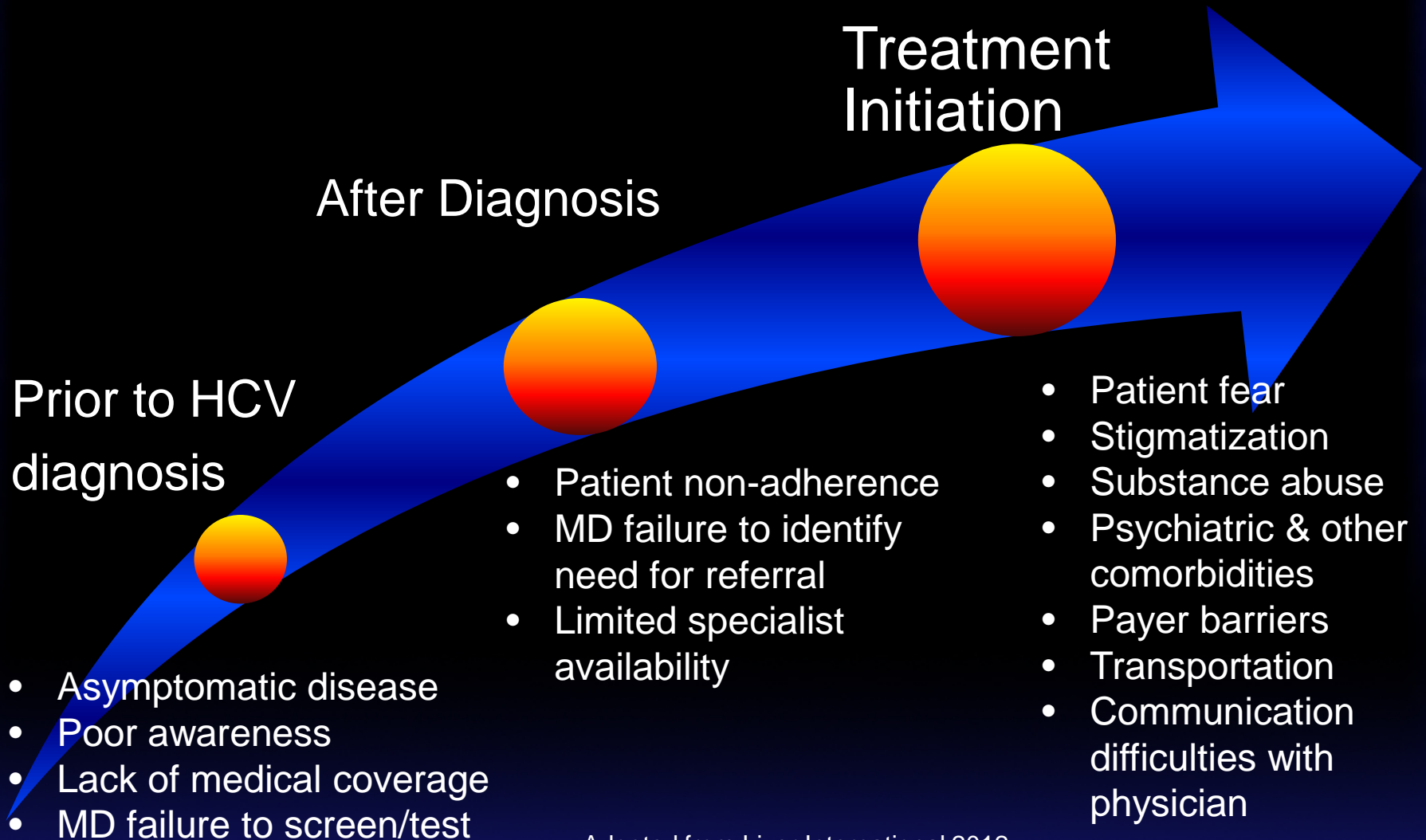
The US Government Has Ignored the Threat of HCV While Allocating Funds in 2011

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



Barriers to HCV Treatment



Poor Screening at PCP Level

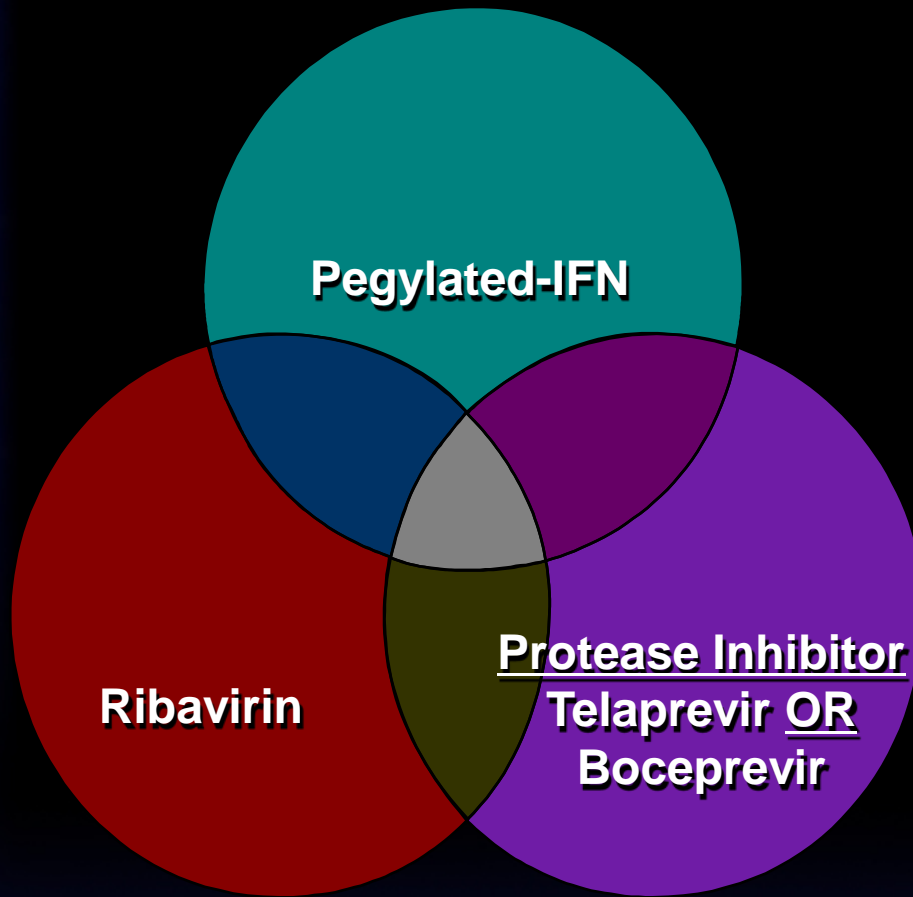
92% of patients with a HCV risk factor were not tested for HCV in the primary care setting

Of the 578 individuals who acknowledged having a HCV risk factor via the questionnaire, only 8% (46/578) were tested for HCV within 2 months of their initial visit

HCV Treatment Rates in Clinical Practice

Author	Cohort/Setting	# Patients	Treatment Rates (%)
Gregbely (2009)	Community-based	1,360	1.1
Butt (2010)	VA National database	134,934	11.9
Cawthorne (2002)	St. Louis VA	557	13.8
Rocca (2004)	Olmstead County	366	15.0
Bini (2005)	24 VA Medical Centers	4,084	17.7
Groom (2008)	Minneapolis VA	520	23.8
Evon (2007)	Academic Medical Center	433	25.2
Morrill (2005)	Primary Care Clinic	208	27.4
Flack-Ytter (2002)	Teaching County Hospital	293	28.3
Butt (2005)	Pittsburg VA	354	29.4
Rowan (2004)	Houston VA	580	30.0

Current Triple Therapy for HCV: Genotype 1



Reduced SVR

- Viral load > 800,000 IU/ml
- Advanced fibrosis/cirrhosis
- Adverse IL28B genotype (CT/TT)
- Prior treatment failure
- Age > 40
- BMI > 30
- Ethnic origin (black vs. non black)
- Type 2 DM

SVR increased from 40 to 70%

Current Challenges in HCV Treatment

Drug Resistance

Drug interactions

Side Effects

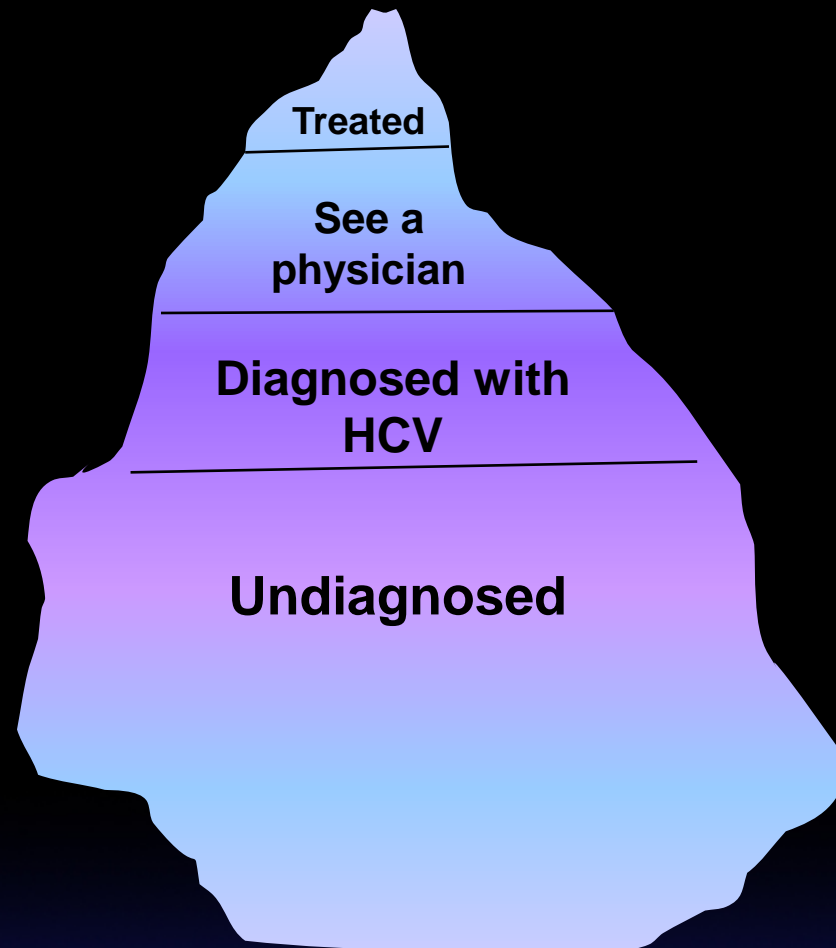
Cost

New HCV Drugs in Development Phase

Host-targeting antivirals	Phase	NS5A inhibitors	Phase	NS5B inhibitors (nucleos/tide)	Phase
alisporivir (DEB025, cyclophilin)	3 (hold)	daclatasvir (BMS-790052)	3	sofosbuvir (GS-7977)	3
SCY-465 (cyclophilin)	2	ABT-267	2	mericitabine (RG-7128)	2
ANA-773 (TLR-7)	1	PPI-461	1b	IDX-184	2 (hold)
		GS-5885	1b	GS-938	2 (hold)
		GSK-2336805	1b	GS-6620	1
		ACH-2928	1b	TMC-649128	1
		ACH-3102	1b		
NS3-4A Inhibitors	Phase			NS5B inhibitors (non-nuc)	Phase
telaprevir	Approved			tegobuvir (GS-9190)	2
boceprevir	Approved			filibuvir (PF-868554)	2
simeprevir (TMC435)	3			setrobuvir (ANA598)	2
faldaprevir (BI201335)	3			BI207127	2
danoprevir/r (RG-7227)	2			VX-222	2
Vaniprevir (MK-7009)	2			ABT-072	2
asunaprevir (BMS-650032)	2			GS-9190	2
GS-9256	2			ABT-333	2
GS-9451	2			BMS-791325	2a
ABT-450/r	2			TMC-647055	1b
sovaprevir (ACH-1625)	2			VCH-759	1
MK-5172	2			GS-9669	1
ACH-2684	1b				
AVL-192	preclinical				

Future therapy appears to be a combination of 2-3 oral drug regimen with minimum side effects.

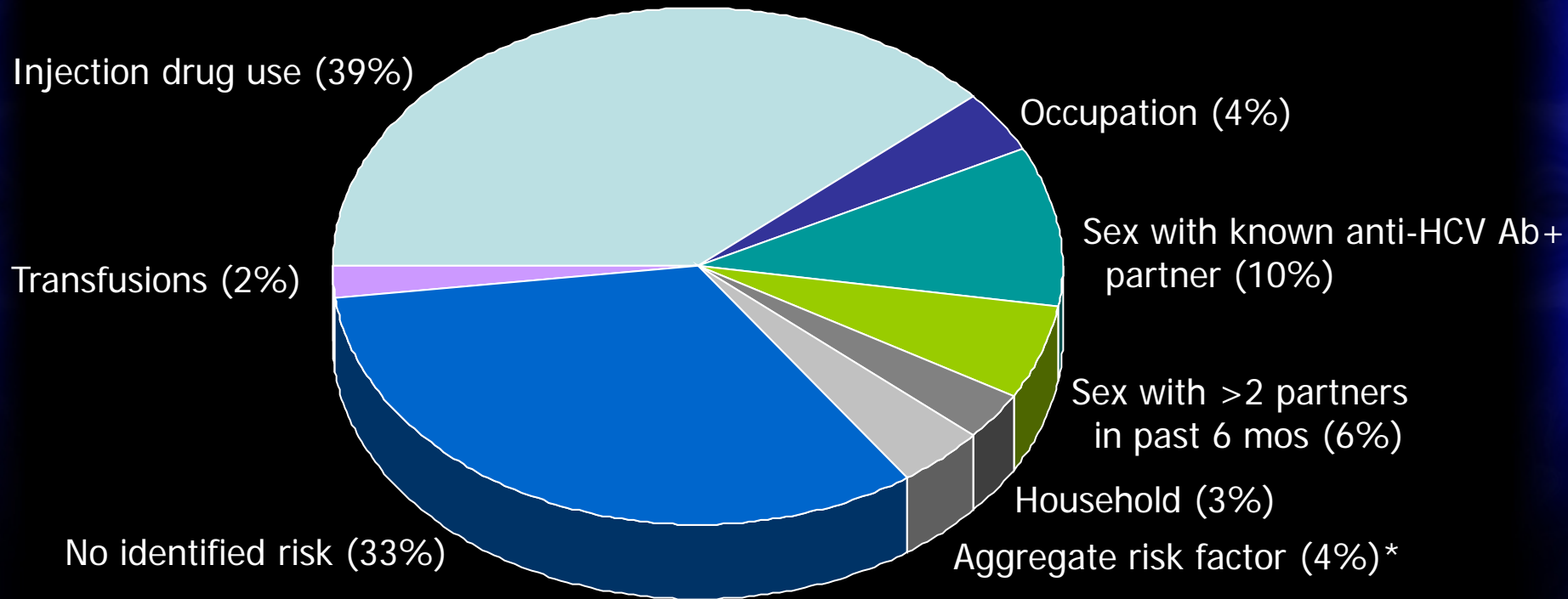
Current Iceberg of HCV



Risk factors for transmission

Risk Factors for HCV Infection

Reported Risk Factors for HCV Infection in the United States, 2001-2004¹



➤ HCV is the most common blood-borne infection in the US²

*Patient is shown a list of risk factors, admits to having one, but does not specify which one.

1. Weinbaum C. Available at: <http://www.iom.edu/Object.File/Master/60/800/Weinbaum%202008-12-04.pdf>.

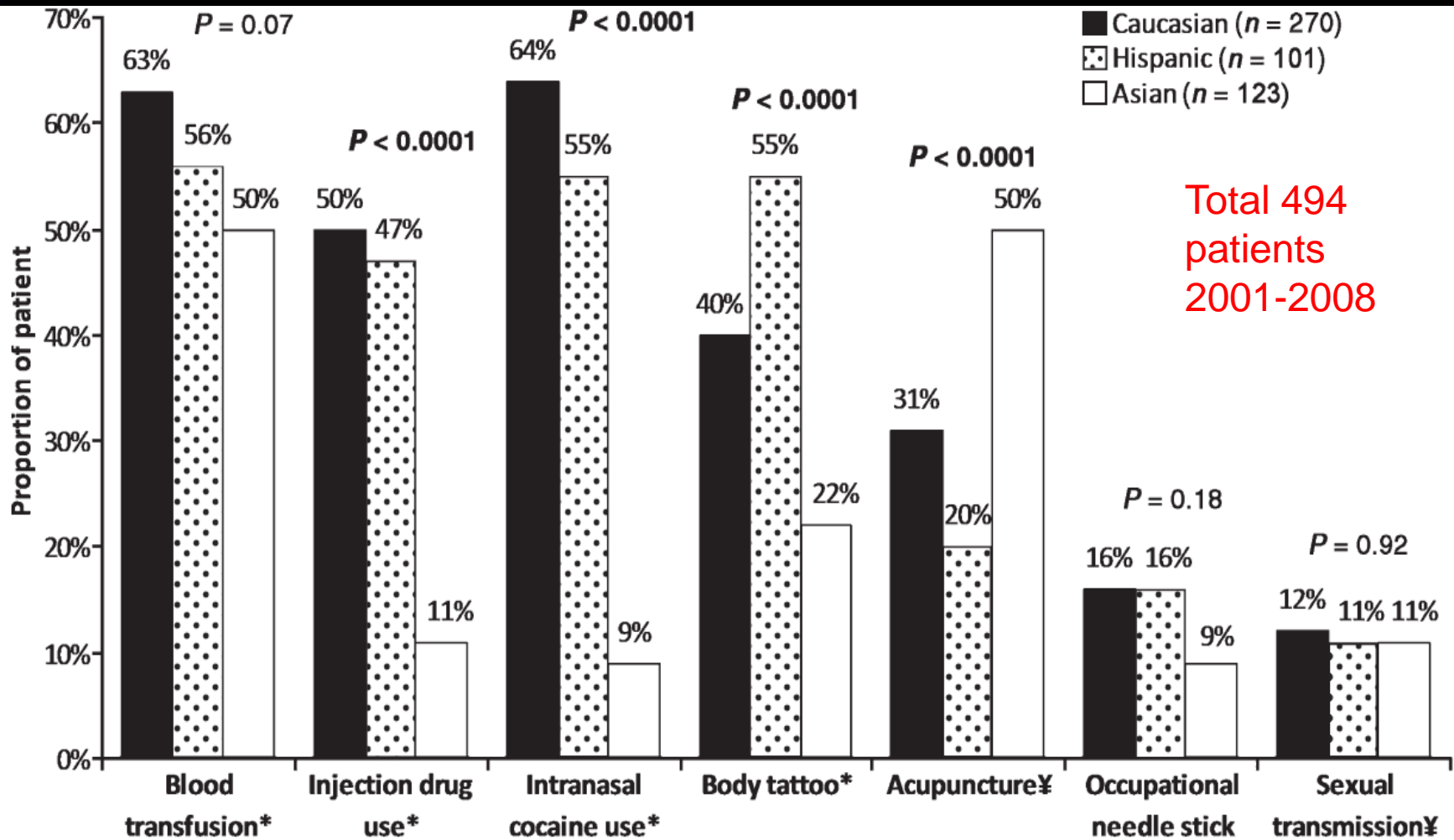
Accessed August 10, 2009. 2. Daniels D, et al. *MMWR Surveill Summ.* 2009;58(3):1-27.

Prospective study of risk factors for hepatitis C virus acquisition by Caucasian, Hispanic, and Asian American patients

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Risk Factors For HCV Transmission



Central Valley Population Based on Ethnicity

Ethnicity	Central Valley Population Estimates*	National Population Estimates
White	52.2%	63.4%
Hispanics	31.9%	16.7%
Asian	7.5%	5.0%
African American	4.7%	13.1%
Others	3.9%	2.4%

Source: U.S. Census Bureau, 2010 Census,
*Approximate parentages

The Data From the Studies Looking at HCV Burden in the Valley

HCV Prevalence Among Blood Donors in the Central Valley

- Data from Central California Blood Center (CCBC) from 2006-2010
- 217,738 healthy voluntary blood donors were identified as follows:
 - 36,795 first-time donors
 - 180,943 second-time donors

*Sheikh MY, Atla PR, Ameer A, Sadiq H, Sadler P. Seroprevalence of Hepatitis B and C infections among healthy volunteer blood donors in the Central California Valley. *Accepted for publication to 'Gut and Liver' on June 9, 2012*

HCV Prevalence in the Valley Among First-Time Blood Donors

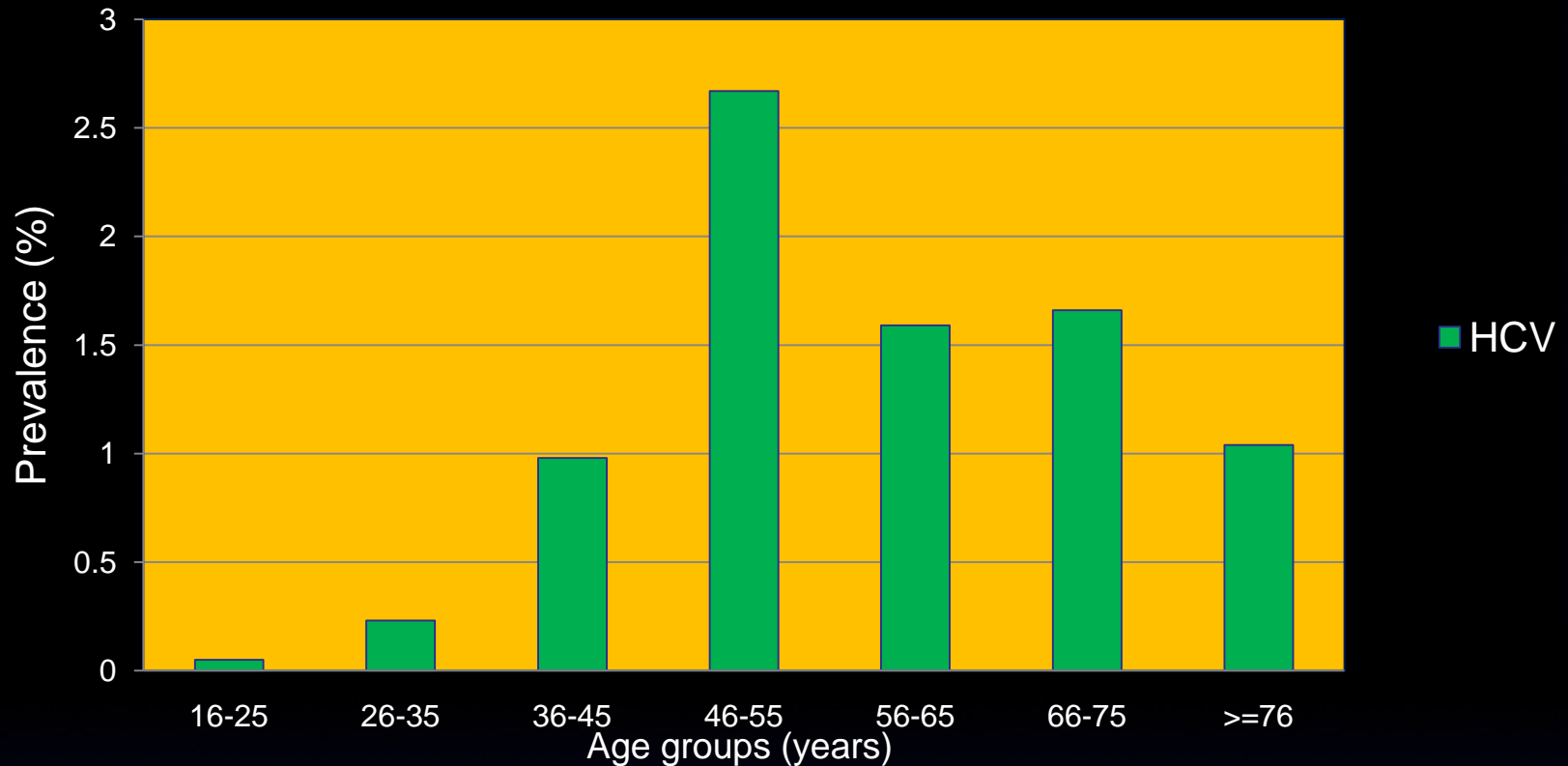
Results:

Category	Prevalence (95%CI)
Total donors	0.52 (0.45-0.6)
Males	0.62 (0.52-0.75)
Females	0.42 (0.33-0.53)
Caucasians	0.59 (0.47-0.72)
AA	0.38 (0.12-0.89)
Hispanics	0.45 (0.35-0.57)
Asians	0.2 (0.07-0.47)
Native Am	2.77 (1.39-4.9)

Prevalence in other similar US studies was 0.23%

Sheikh MY, Atla PR, Ameer A, Sadiq H, Sadler P. Seroprevalence of Hepatitis B and C infections among healthy volunteer blood donors in the Central California Valley. *Accepted for publication to 'Gut and Liver' on June 9, 2012*

HCV prevalence trends across age groups among first-time donors



Sheikh MY, Atla PR, Ameer A, Sadiq H, Sadler P. Seroprevalence of Hepatitis B and C infections among healthy volunteer blood donors in the Central California Valley. *Accepted for publication to 'Gut and Liver' on June 9, 2012*

HCV Prevalence in the Valley Among First-time Blood Donors

Conclusions:

- Ethnic disparities persist in the prevalence of HCV in the Central Valley.
- This prevalence may be an underestimate as our study enrolled healthy volunteer blood donors only.

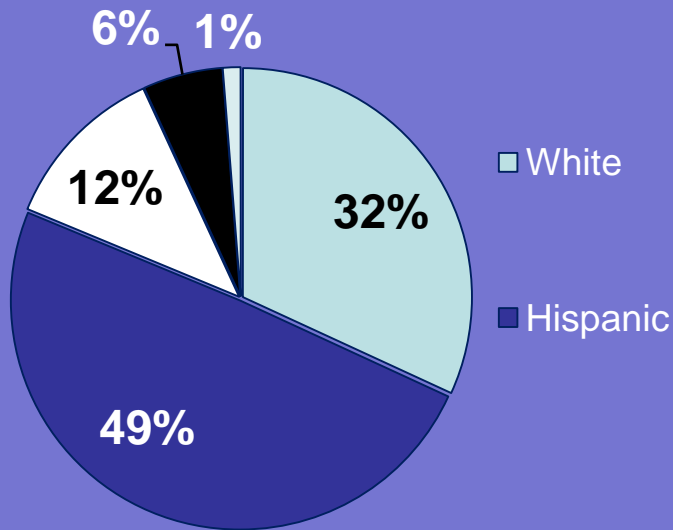
HCV Prevalence in Santé Health System (Quest Diagnostics Data: 2008-8/2012)

Year	Total Sante HMO Population	Patients with HCV	Prevalence of HCV in Sante Population	Males Total (HCV+)	Females Total (HCV+)	Mean Age Sante (HCV +)
2008	107,844	4,521	4.2%	52,246 (2795)	55,598 (1726)	33 (51)
2009	111,490	3,971	3.6%	53,925 (2491)	57,565 (1480)	32 (51)
2010	103,295	4,258	4.1%	49,554 (2004)	53,741 (2254)	33 (53)
2011	97,679	3,464	3.5%	46,651 (1581)	51,028 (1183)	35 (54)
2012 (8 M)	100,861	2,533	2.5%	47,983 (1196)	52,878 (1319)	38 (58)

Survival of the Liver Cancer Patients in the Central Valley

About half of the liver cancers in US are caused by hepatitis C

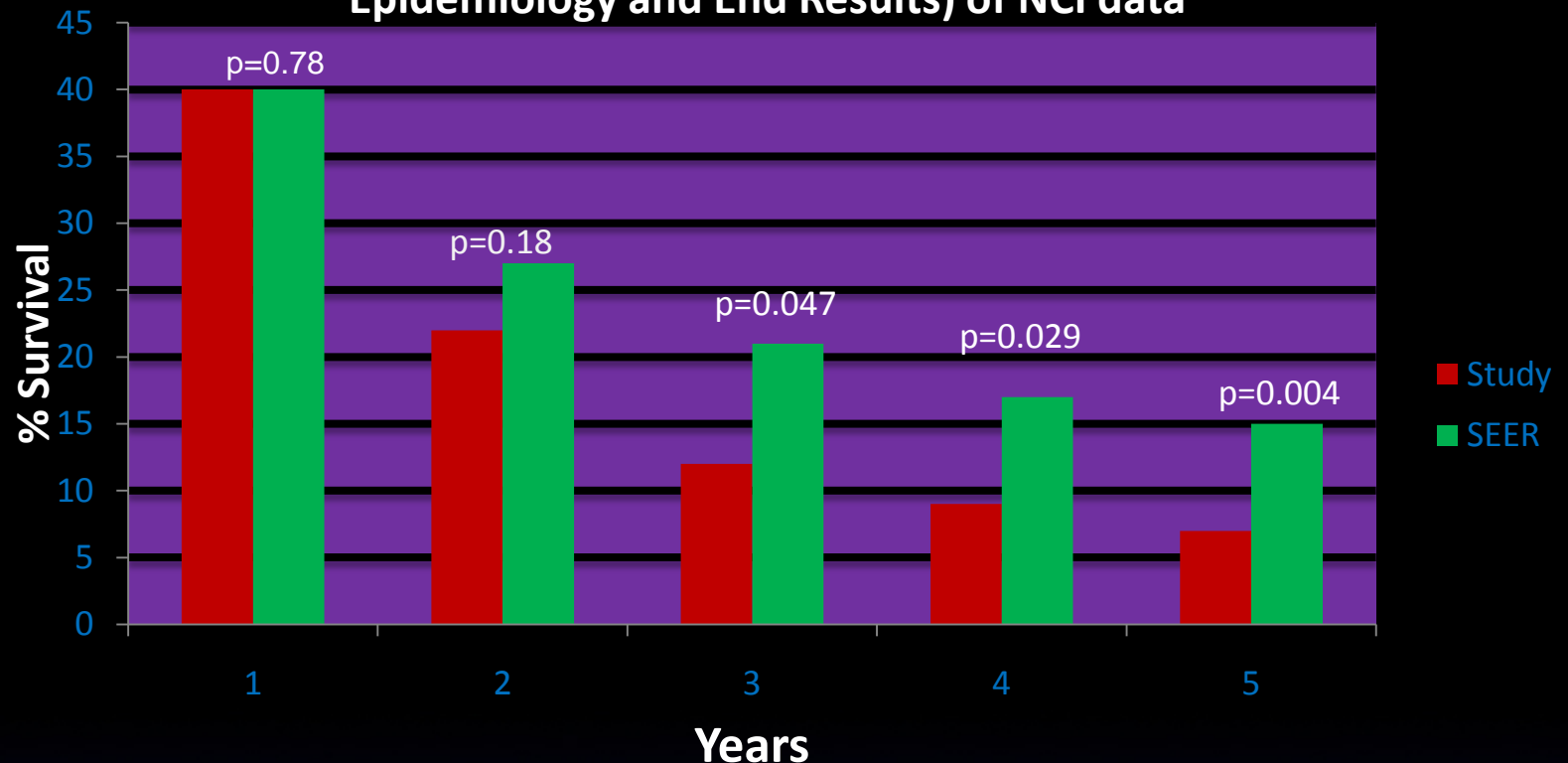
Figure 1. Racial distribution of the study patients



- A retrospective review of 160 HCC patients
- 62% HCV, 44% ETOH, 10% HBV
- Males: 80%
- Mean AFP 399
- Almost all had decompensated cirrhosis
- Patients were followed up to 5 years
- Survival of valley patients was compared with California Cancer Registry-a participant in the Survival Epidemiology and End Results (SEER) program of NCI

Survival of the Liver Cancer Patients in the Central Valley

Yearly survival of study group versus SEER (Survival Epidemiology and End Results) of NCI data



Atla PR, Sheikh MY, Mascarenhas R, Choudhury J, Mills P. Survival of patients with hepatocellular carcinoma in the San Joaquin Valley: A comparison with California Cancer Registry data. *Ann Gastroenterol* 2012; 25 (2): 138-146

Survival of HCC in the Central Valley

Treatment class	N (%)	Median survival (months)
Transplantation	9 (5.6%)	69
Non-surgical	55 (34.4)	9
Palliative	96 (60%)	3

Atla PR, Sheikh MY, Mascarenhas R, Choudhury J, Mills P. Survival of patients with hepatocellular carcinoma in the San Joaquin Valley: A comparison with California Cancer Registry data. *Ann Gastroenterol* 2012; 25 (2): 138-146

HCC survival in the Central Valley

Conclusions:

- Outcome of patients with HCC in the Valley is poorer compared to the general California population
- Higher Hispanic representation coupled with late diagnosis could have contributed to overall poor HCC survival
- There is presently a dire need to improve HCC surveillance in the Valley

Current Issues

- Actual HCV prevalence is largely unknown in the Valley and hence it remains a persistent public health problem
- Diverse ethnic population:
 - Risk factors for transmission?
 - Barriers for screening and treatment?
- Inadequate health care providers
- Economic issues
- Lack of funding and resources for research and mounting an effective campaign for HCV

PLAN OF ACTION

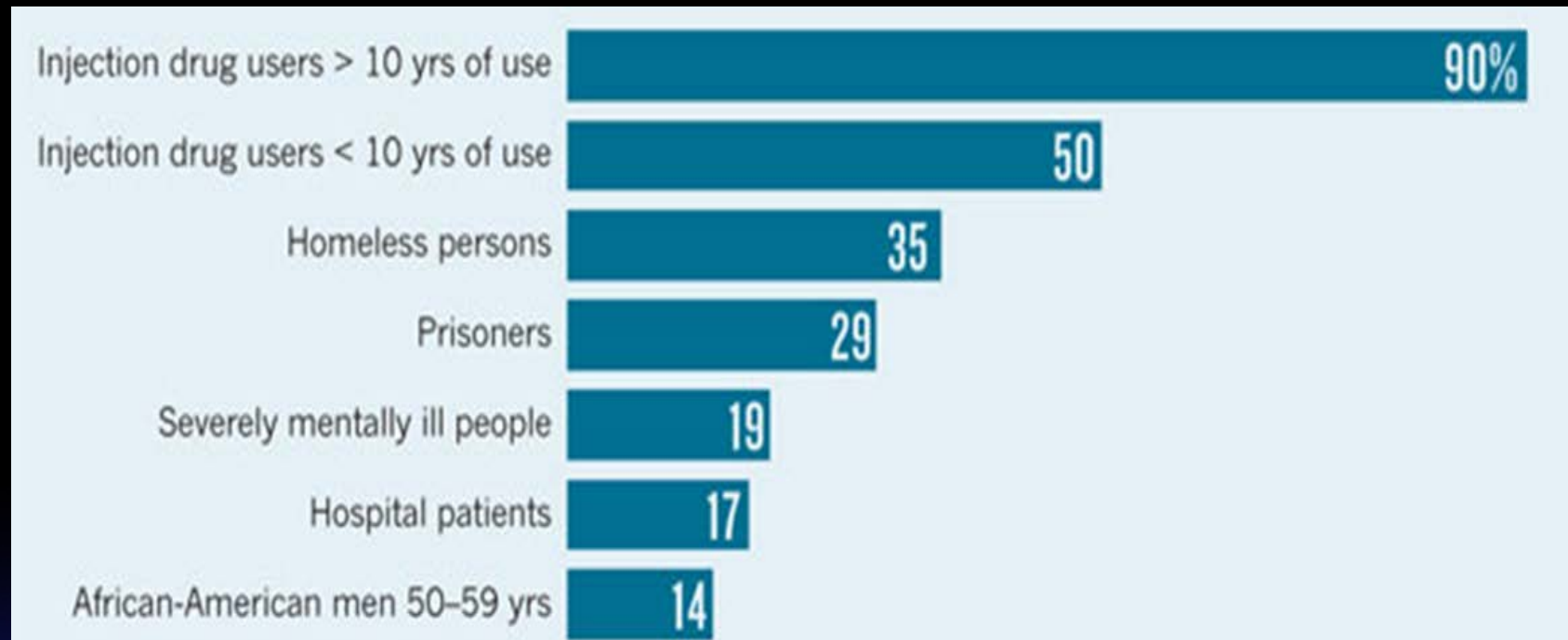
Confronting the epidemic

- Raise Awareness
- Preventive Strategies:
 - Provide needle-exchange facilities
 - Community-based outreach and education
 - Community-based services for testing and counseling
- Develop effective surveillance program based on current guidelines

PLAN OF ACTION

Confronting the epidemic

- Develop strategies to treat subgroups of those with the highest prevalence of HCV:



PLAN OF ACTION

Confronting the epidemic

- Develop multidisciplinary program for HCV treatment (PCP, specialists, pharmacist, educators, social workers, etc.) through funding (May utilize Project **ECHO** like program pioneered by Dr Sanjeev Arora at the University of NM, Albuquerque)
- Research
 - Epidemiology
 - Prevention: HCV & comorbidities (ETOH/obesity)

Questions & Comments