

# Mortality among Persons in Care with Hepatitis C Virus Infection—Chronic Hepatitis Cohort Study (CHeCS), 2006 -2010

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## BACKGROUND

- Estimated 2.7-3.9 million persons with chronic hepatitis C virus infection (HCV)
- Deaths from 1999-2007 with HCV infection listed as a primary or underlying cause of death, 57% had chronic liver disease as a cause

## OBJECTIVE

- To examine the association of HCV with all-cause and liver-related mortality, we analyzed data from a prospective observational cohort study in four health care systems in the US

## METHODS

- Calculated all-cause and disease-specific death rates for Chronic Hepatitis Cohort Study (CHeCS) patients and compared with national Multiple Cause of Death (MCO) data from 12 million US death certificates 2006-2010
- Examined pre-mortem diagnoses, liver biopsies, and FIB-4 scores (a non-invasive measure of liver damage)

## RESULTS

**Table 1:** Demographics of Deaths among 1,590 CHeCS Chronic HCV Patients, 2006-2010

Characteristic	Number (%)
<b>Age, years</b>	
18-29	15 (1)
30-44	68 (4)
45-59	953 (60)
60-75+	554 (34)
<b>Sex</b>	
Male	1086 (68)
Female	504 (32)
<b>Race</b>	
White	790 (50)
Black	551 (35)
Hispanic/Asian/PI	91 (6)
<b>Median household income</b>	
<15,000	64 (4)
>=15,000-<50,000	1076 (72)
>=50,000	367 (25)

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## RESULTS CONTINUED

**Table 2:** Comparison of Age-Adjusted Mortality Rates in the 1,590 CHeCS Chronic HCV Patients Compared with the Multiple Cause of Death (MCO) Data (N= 12,249,640) by Causes of Death, 2006-2010\*

Cause of Death	Annual Mortality Rate per 100,000 Persons		
	CHeCS	MCO	Relative risk (95% CI)+
<b>HCV</b>	414.3	6.8	61.4 (60.4-62.3)
Liver-related, non-alcohol	669.3	27.4	24.4 (24.2-24.6)
<b>Liver-related, alcohol</b>	50.9	8.2	6.20 (6.1-6.3)
<b>Liver cancer</b>	250.0	8.7	28.80 (28.3-29.2)
<b>Hepatitis-related (unspecified)</b>	72.4	0.8	86.10 (82.4-90.1)
<b>HIV</b>	50.6	5.2	9.80 (9.6-10.0)
<b>Cancer, except liver cancer</b>	344.6	269.2	1.28 (1.28-1.29)
<b>Circulatory</b>	827.2	582.2	1.42 (1.42-1.43)
<b>Respiratory</b>	370.8	268.1	1.38 (1.38-1.39)
<b>Diabetes</b>	179.0	101.1	1.77 (1.76-1.78)
<b>Genitourinary</b>	435.3	116.1	3.75 (3.73-3.77)
<b>Injuries/Trauma</b>	289.2	99.9	2.90 (2.88-2.91)
<b>Mental and behavioral disorders</b>	426.1	189.0	2.25 (2.25-2.26)
<b>Digestive (extra-hepatic)</b>	160.0	51.0	3.14 (3.12-3.16)
<b>Other</b>	680.9	361.9	1.88 (1.88-1.89)

\*Cases could have more than one listed cause of death, so total will be greater than 1,590. A mean mortality rate from 2006-2010 was calculated for CHeCS and MCO data. Data was age-standardized to the census population in 2008.

+All p values <.0001

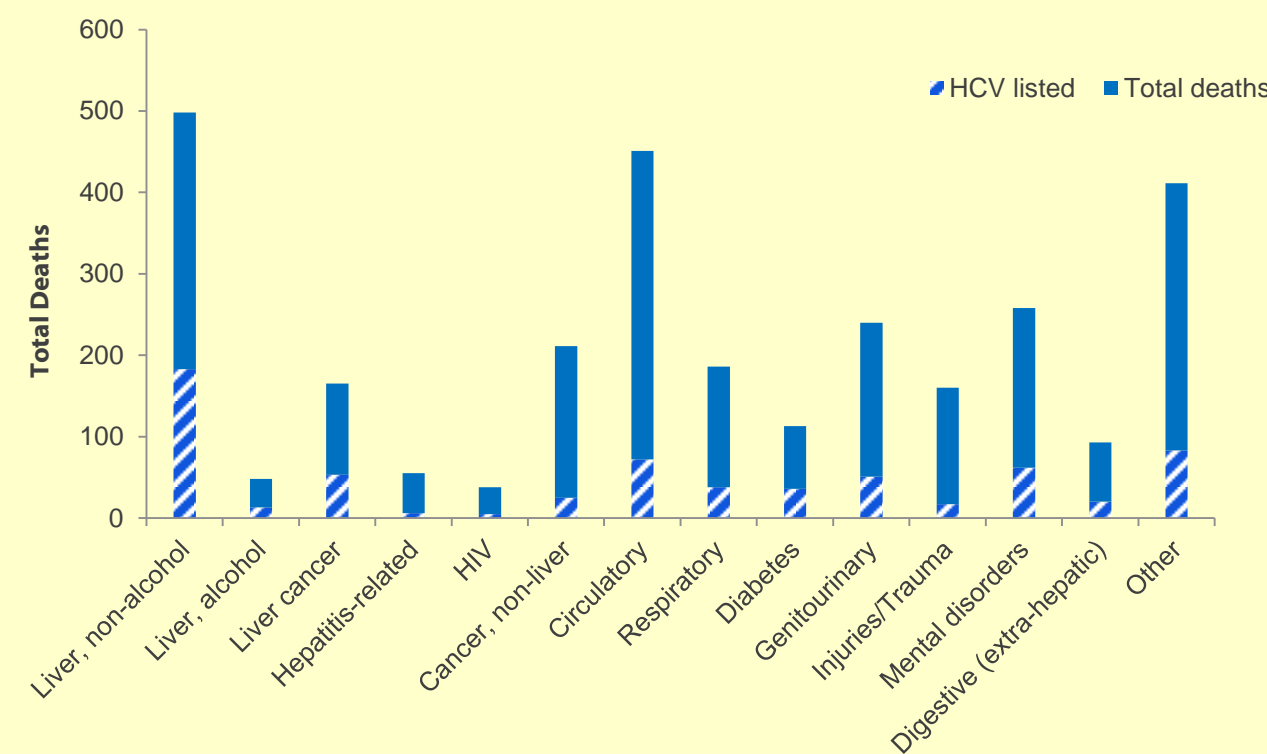
### Table 1:

- Of 2.1 million adult patients, 11,703 had chronic HCV
- 1,590 (14%) deaths
- Of decedents, 60% were 45-59 and 50% were white

### Table 2:

- CHeCS age-adjusted mortality rate was 6-86 times higher for liver-related causes and higher overall for all categories when compared to national MCO data
- Overall CHeCS age-adjusted mortality rate was 12 times higher than the MCO rate

**Figure.** All Causes of Death with HCV Listed as a Contributing Cause of Death in the CHeCS Chronic HCV Patients, 2006-2010



### Figure:

- Overall 19% (306/1,590) had HCV listed on the death certificate
- Only 32% of liver cancer deaths had HCV noted on the death certificate
- HCV not listed for majority of deaths whether liver or non-liver related
- Liver disease was present in 63% of patients based on medical records (ICD-9 codes) and 76% based on FIB-4 scores [data not shown]

## DISCUSSION

- Even in these well characterized HCV patients, HCV was noted in only 19% of death certificates,
- This suggests that the 16,622 persons with HCV listed on death certificates in 2010 actually represent > 80,000 persons dying with HCV that year.
- Mortality rate estimated from this analysis was twelve times higher than the general population
- Mean age of death in HCV-infected persons (59 years) was 15 years younger than for all-cause mortality in the general population (74 years)
- Chronic liver disease present in two-thirds of CHeCS decedents suggests that 53,000 patients are dying not only with, but possibly from HCV

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