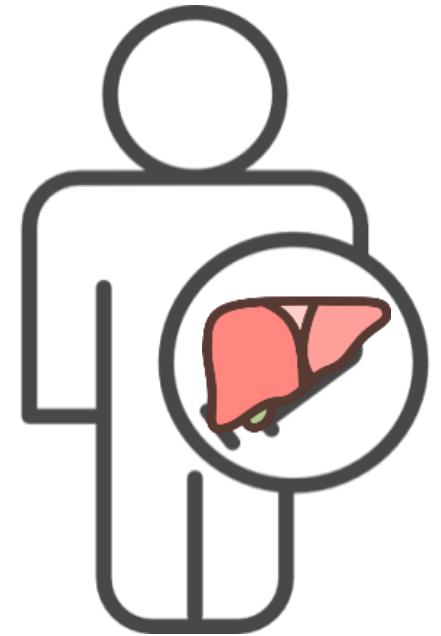


Sensitivity of Death Certificates For Hepatitis B & C Related Mortality, Philadelphia

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Background



Viral Hepatitis (VH) Elimination

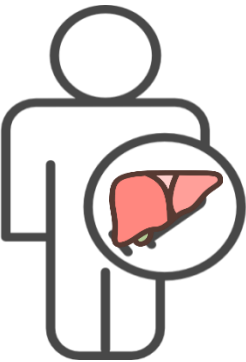
- Goals:
 - World Health Organization (2016): 65% reduction in global mortality due to hepatitis B virus (HBV) & hepatitis C virus (HCV) by 2030¹
 - Centers for Disease Control & Prevention (CDC)(2017): $\geq 20\%$ reduction in national mortality due to HBV & HCV by 2025
- Need data source to quantify deaths due to VH:
 - Death certificate data is a readily available

1. WHO. Combating Hepatitis B & C to Reach Elimination by 2030. World Health Organization, Geneva; 2016. Available at: <https://www.who.int/publications/i/item/combating-hepatitis-b-and-c-to-reach-elimination-by-2030>

Methods- Study Goals

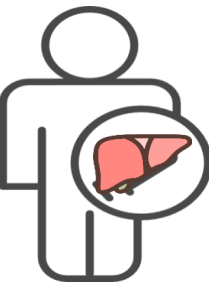
Determine the utility of using death certificates as a data source for measuring critical elimination goal progress

1. Measure sensitivity/completeness of HBV, HCV, or viral hepatitis listed as a COD/contributing COD
2. Identify deaths related to VH where VH is *not* listed as COD
 - Consider potential proxy for a VH-related death



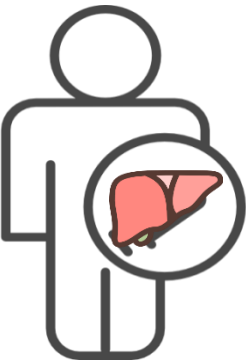
Methods- Data

- Vitals data: Death of Philadelphia residents via electronic death certificate (DC)
 - 1/1/2015 – 10/31/2021
- Viral Hepatitis data: HBV & HCV cases reported to Philadelphia Department of Public Health's Viral Hepatitis Registry
 - Past or present infection at death
 - 1/1/2015 – 12/31/2020



Methods- Analysis

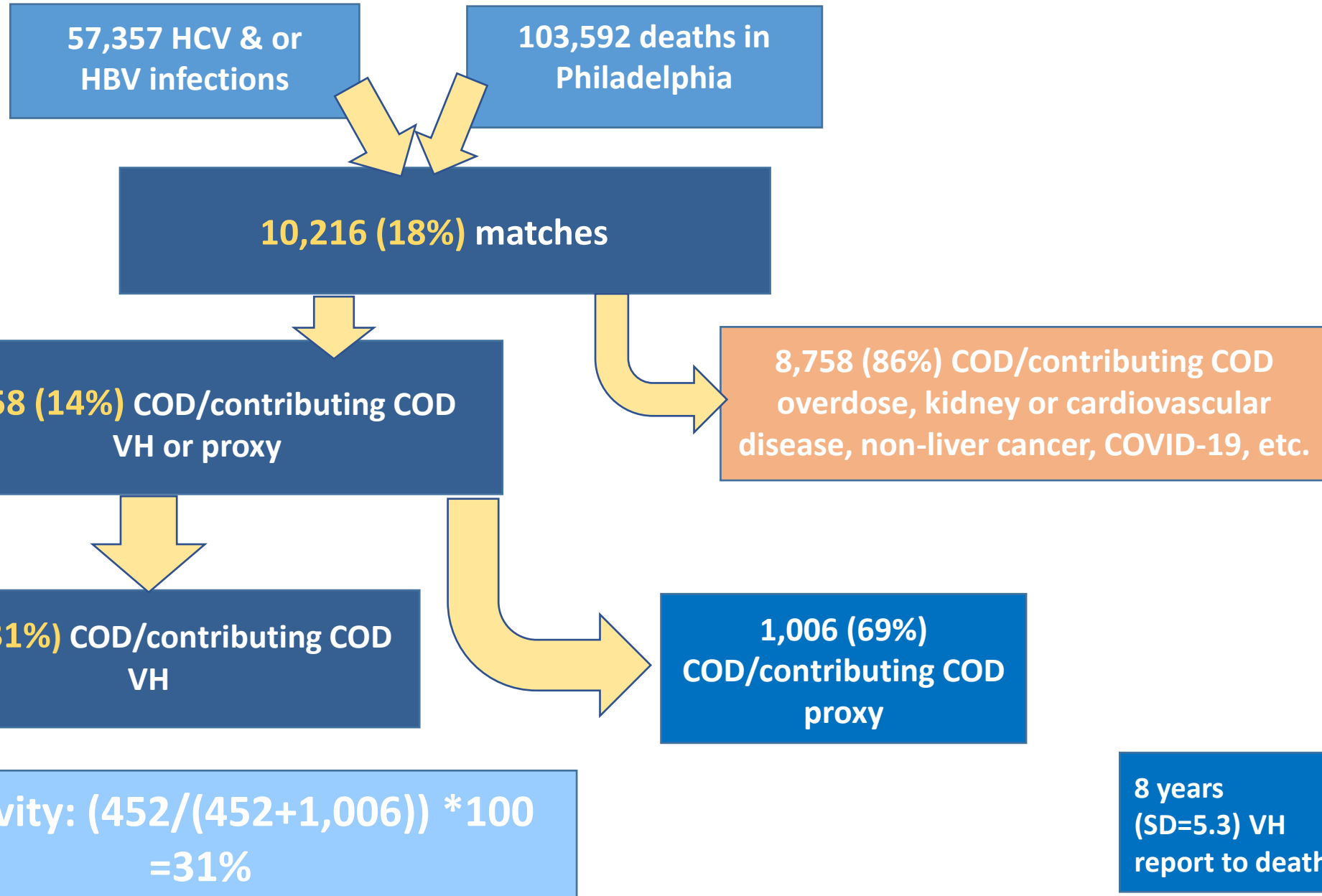
- Matched DC and Viral Hepatitis Registries on name & DOB
- Sensitivity measured for:
 1. DC indicated VH as a COD/contributing COD
 2. CODs likely caused by viral hepatitis ² (i.e. liver disease (non-alcoholic) & hepatocellular carcinoma (HCC))
- Created new VH death estimate
- Assessed associations with various factors on DC (including Demographic & social factors, time from viral hepatitis event to death, & DC signee)
 - Chi-Square, Fisher's exact, & t-test analysis used, where appropriate
 - Logistic regression to account for significant covariate relationships



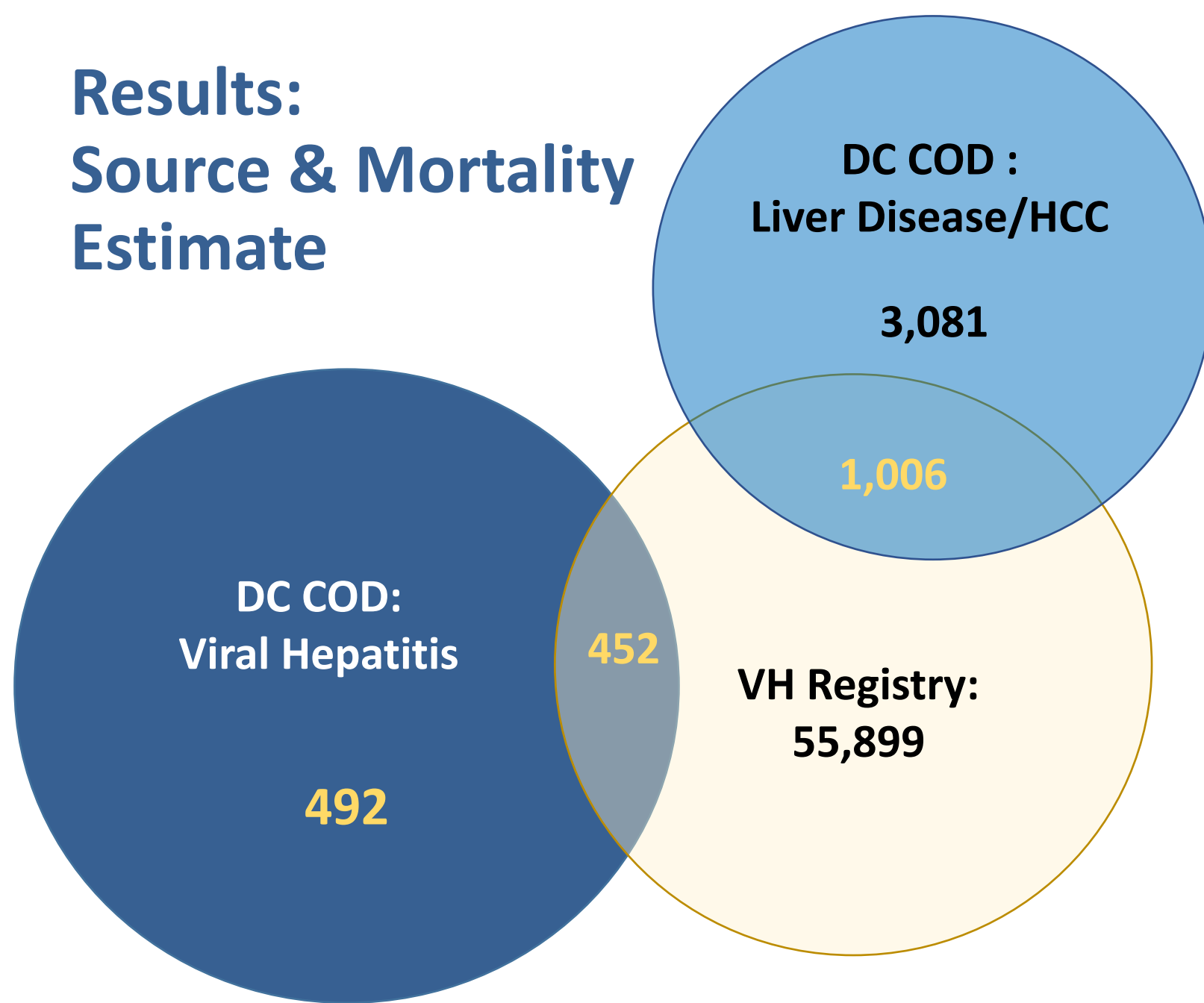
Results: Sensitivity of DCs to Identify VH-related Death

Note: VH= hepatitis B, hepatitis C, or viral hepatitis

proxy= non-alcoholic liver disease or HCC



Results: Source & Mortality Estimate



DC-based mortality: 944



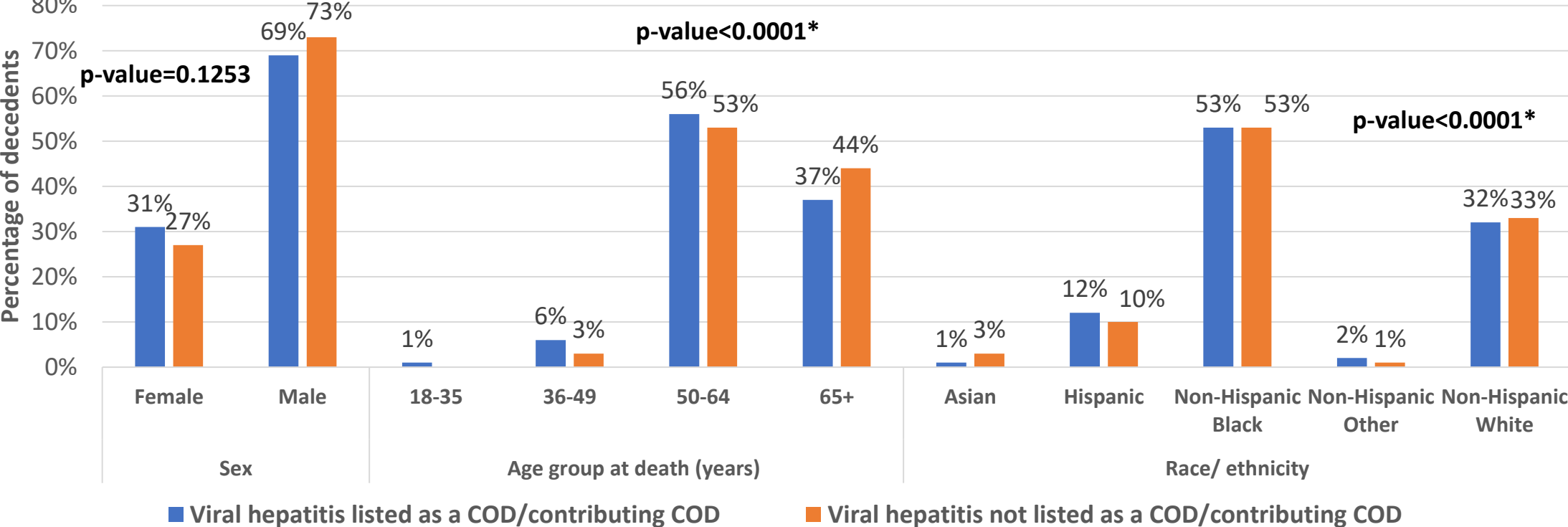
Total VH related mortality:
1,950

% of deaths due to VH identified :

- DC COD is VH: **48%**
- DC & VH Registry matched: **75%**

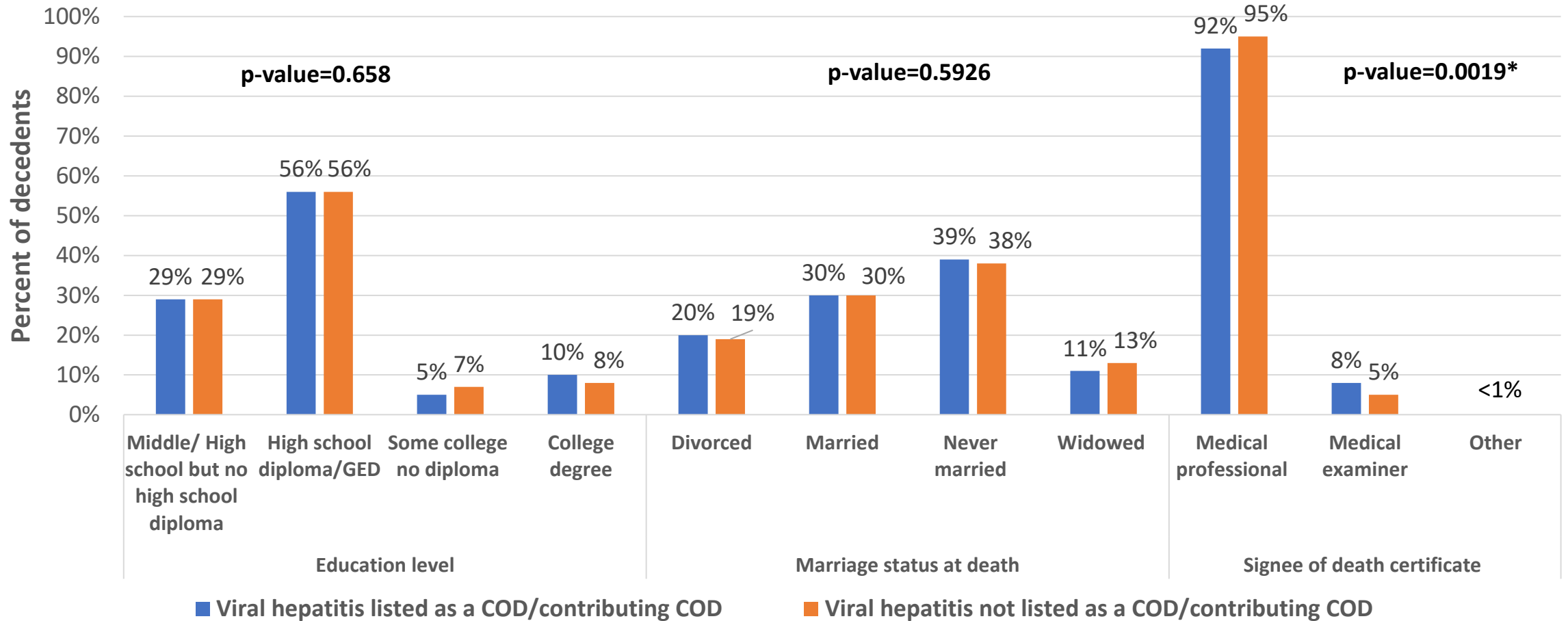
*65%³ of HCC caused by VH → 593
additional individuals may be
attributable to VH as well*

Results: Demographics of Decedents Who Had Hepatitis B/C



* Significant at a p-value of ≤ 0.05

Results: DC-Sourced Factors & Hepatitis B/C Status



*Significant at a p-value of ≤ 0.05

Results: aOR for COD/Contributing COD Listing Viral Hepatitis

		aOR	95% CI
Age group at death (years)	18-35	1.7	(0.28-10.45)
	36-49	2.34	(1.32-4.15)
	50-64	1.29	(1.01-1.64)
	65+	ref	ref
Race/ ethnicity	Asian	0.48	(0.18-1.27)
	Hispanic	1.03	(0.69-1.54)
	Non-Hispanic Black	1.11	(0.86-1.44)
	Non-Hispanic White	ref	ref
	Non-Hispanic Other	3.74	(1.30-10.81)
Death certificate signee	Medical professional	0.59	(0.37-0.95)
	Medical examiner	ref	ref
	Other	0.26	(0.03-2.38)



Having Viral hepatitis listed as a COD/ contributing COD:

- **2.34 increased odds among decedents aged 36-49 years**
- **1.29 increased odds among decedents aged 50-64 years**
- **41% decreased odds among records that had a medical professional as the signee**

Limitations

- Not able to calculate PPV since decedents that were not in our VH Registry could not be used in this analysis
- Not everyone with Viral Hepatitis is diagnosed
- Further analysis will need to be done to validate the proxy of using non-alcoholic liver disease & HCC



Conclusions

- In Philadelphia, **death certificates data is an incomplete** source for viral hepatitis-related mortality due to low sensitivity of HBV & HCV reporting
- Jurisdictions should validate any data sources used to assess metrics around death for elimination activities
- Explore updating standardized protocols for medical professionals to improve reporting of viral hepatitis in cases of liver-related death
- **Use of a match with VH registries & a proxy for CODs such as liver cancer & liver disease should be considered to understand mortality impacts for viral hepatitis**



Thank you!

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