



**GIG**  
CYMRU  
**NHS**  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

# Assessing rates of viral hepatitis in Black and Minority Ethnic groups living in Wales using ‘Onomap’, a name-based ethnicity classification software package

Daniel Thomas  
Communicable Disease Surveillance Centre,  
Public Health Wales



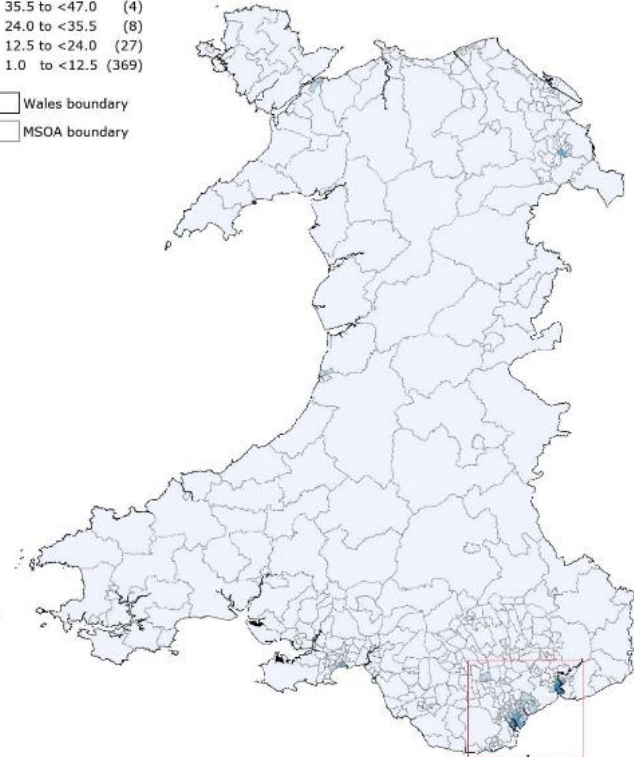
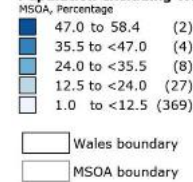
*“An ethnic group is a collectivity within a larger population having real or putative common ancestry, memories of a shared past, and a cultural focus upon one or more symbolic elements which define the group’s identity, such as kinship, religion, language, shared territory, nationality or physical appearance. Members of an ethnic group are conscious of belonging to an ethnic group”.*

Bulmer, M. (1996) “The ethnic group question in the 1991 Census of Population”, “Ethnicity in the 1991 Census of Population”, Eds. Coleman, D and Salt, J. HMSO, p35.

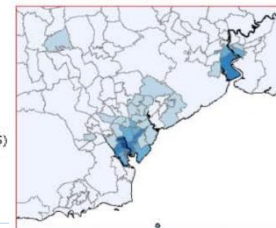
## Ethnic diversity in Wales

- Less ethnically diverse than any English region except North East.
- 94% are White British or Irish
- The remaining population is diverse, with 'Other White' (55,932; 1.8%) and 'Asian or Asian British – Indian' (17,256; 0.6%) groups most frequent.
- The age structure of the White British or Irish population is much older than the other groups
- People describing themselves as not White British or Irish are concentrated in urban centers.
- The percentage of the population of Wales who define themselves as not White British or Irish doubled from 3% to 6% between 2001 and 2011

Population excluding White British or Irish\*, all ages, Wales, 2011



Cardiff and Newport



Produced by Public Health Wales Observatory, using 2011 Census data table KS201EW (ONS)  
© Crown Copyright and database right 2015, Ordnance Survey 100044810

\*Population excluding White British or Irish is defined as the following: White Gypsy or Irish Traveller, White other, Mixed/multiple ethnic group, Asian/Asian British, Black/African/Caribbean/Black British or Other ethnic group.

# Viral hepatitis in BME groups

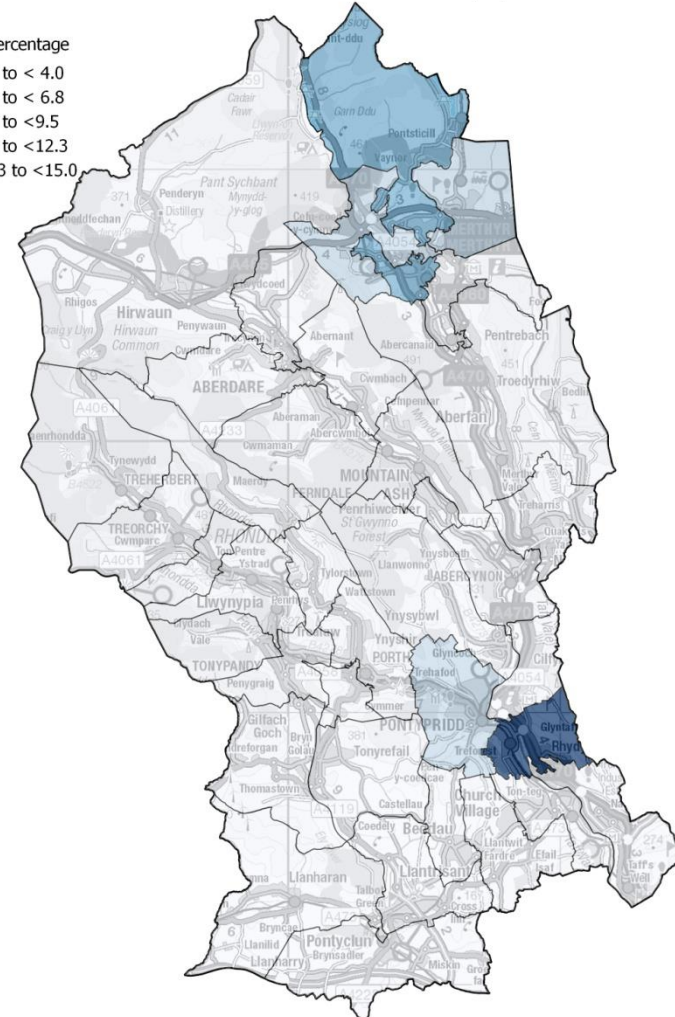
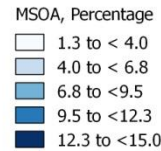


GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

Proportion of Cwm Taf  
University Health Board  
recorded as not White-British or  
White-Irish by MSOA, 2011

**Proportion of Cwm Taf University Health Board resident population recorded as not White-British or White-Irish in the 2011 Census, by MSOA**



\*Population excluding White British and Irish defined as the following: White Gypsy or Irish Traveller, White Other, Mixed/multiple ethnic group, Asian/AsianBritish, Black/African/Caribbean/Black British or Other ethnic group

Produced by Public Health Wales Health Protection CDSC, using 2011 Census data table DC2101EW  
© Crown Copyright and database right 2017, Ordnance Survey 100044810



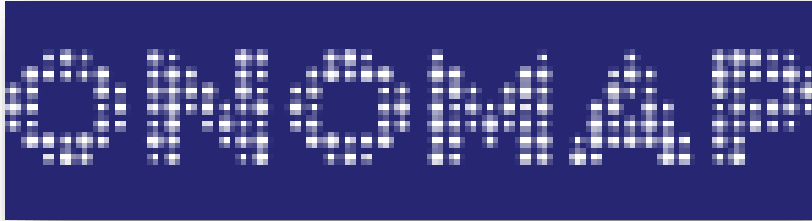
## Background to project

1. Although a key determinant of health, ethnicity is poorly recorded in clinical data sets
2. This is true for notifications of communicable disease
3. Is it possible to assign ethnicity to laboratory confirmed cases of viral hepatitis in Wales, to explore variation in testing and notification rates?



## **Aim of project**

To develop a method to measure ethnic inequalities in the incidence of communicable disease in Wales, in order to inform policy on prevention and control.



A name-based ethnicity classification software package, developed at University College London

Early versions of the software were based upon the [Worldnames](#) database, which originally included 20 or so countries. Since been expanded.

Applications in health, business, human genetics and social media analysis

Future developments, see: <http://www.onomap.org/>

*Warning: Colombian website [Onomap.co](#)*

# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales



Daniel Thomas  
White - British



Janusz Janiec  
White - Other



George Karani  
Black - African



# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales



Daniel Thomas  
White - British



Janusz Janiec  
White - Other



George Karani  
Black - African



# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales



Daniel Thomas  
White - British



Janusz Janiec  
White - Other



George Karani  
Black - African

# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales



Daniel Thomas  
White - British



Janusz Janiec  
White - Other



George Karani  
Black - African





## Validation of 'Onomap' software

Three data sets with patient names and self-reported ethnicity:

1. TB surveillance data, n=2,833
2. People screened for hepatitis C in a community setting, n=189
3. Patients attending a hospital clinic in Poland, n=3,184

# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

Ethnicity	Ethnicity reported by participant	Ethnicity predicted by Onomap	Ethnicity correctly predicted	Sensitivity	Specificity
White British or Irish	1681	1811			
Other White	3235	3418			
<b>Total White</b>	4916	5229	4844	<b>98.5%</b>	<b>77.7%</b>
Indian	364	239			
Pakistani	313	348			
Bangladeshi	96	88			
Chinese	55	18			
Other Asian	9	118			
<b>Total Asian or Asian British</b>	837	811	609	<b>72.8%</b>	<b>96.5%</b>
Black - African	344	142			
Black - Caribbean	10	1			
Other Black	23	0			
<b>Total Black or Black British</b>	377	143	112	<b>29.7%</b>	<b>99.5%</b>
Arabic	36	279			
Other	9	4			
<b>Other Ethnic Group</b>	45	283	24	<b>53.3%</b>	<b>96.1%</b>
<b>Mixed</b>	234	0	-		
<b>Unclassified/Unknown</b>	231	174	8	<b>3.5%</b>	<b>97.4%</b>
<b>Total</b>	6640	6640	<b>5589</b>	<b>87.4%</b>	<b>96.1%</b>

# Viral hepatitis in BME groups

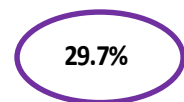


GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

Ethnicity	Ethnicity reported by participant	Ethnicity predicted by Onomap	Ethnicity correctly predicted	Sensitivity	Specificity
White British or Irish	1681	1811			
Other White	3235	3418			
<b>Total White</b>	4916	5229	4844	<b>98.5%</b>	<b>77.7%</b>
Indian	364	239			
Pakistani	313	348			
Bangladeshi	96	88			
Chinese	55	18			
Other Asian	9	118			
<b>Total Asian or Asian British</b>	837	811	609	<b>72.8%</b>	<b>96.5%</b>
Black - African	344	142			
Black - Caribbean	10	1			
Other Black	23	0			
<b>Total Black or Black British</b>	377	143	112	<b>29.7%</b>	<b>99.5%</b>
Arabic	36	279			
Other	9	4			
<b>Other Ethnic Group</b>	45	283	24	<b>53.3%</b>	<b>96.1%</b>
<b>Mixed</b>	234	0	-		
<b>Unclassified/Unknown</b>	231	174	8	<b>3.5%</b>	<b>97.4%</b>
<b>Total</b>	6640	6640	<b>5589</b>	<b>87.4%</b>	<b>96.1%</b>

Sensitivity poor for 'Black' groups



# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

Ethnicity	Ethnicity reported by participant	Ethnicity predicted by Onomap	Ethnicity correctly predicted	Sensitivity	Specificity
White British or Irish	1681	1811			
Other White	3235	3418			
<b>Total White</b>	4916	5229	4844	<b>98.5%</b>	<b>77.7%</b>
Indian	364	239			
Pakistani	313	348			
Bangladeshi	96	88			
Chinese	55	18			
Other Asian	9	118			
<b>Total Asian or Asian British</b>	837	811	609	<b>72.8%</b>	<b>96.5%</b>
Black - African	344	142			
Black - Caribbean	10	1			
Other Black	23	0			
<b>Total Black or Black British</b>	377	143	112	<b>29.7%</b>	<b>99.5%</b>
Arabic	36	279			
Other	9	4			
<b>Other Ethnic Group</b>	45	283	24	<b>53.3%</b>	<b>96.1%</b>
<b>Mixed</b>	234	0	-		
<b>Unclassified/Unknown</b>	231	174	8	<b>3.5%</b>	<b>97.4%</b>
<b>Total</b>	6640	6640	<b>5589</b>	<b>87.4%</b>	<b>96.1%</b>

'Mixed' ethnic groups not included in Onomap



## Validation of 'Onomap' software: Conclusions

1. The version of Onomap we used lacked specificity and sensitivity for some ethnic groups
2. Not able to identify mixed ethnicity groups
3. Gender and generation will affect sensitivity (not yet tested)
4. Differences in sensitivity and specificity should be considered when interpreting findings





## **Assessing rates of viral hepatitis in Black and Minority Ethnic groups living in Wales using ‘Onomap’, a name-based ethnicity classification software package**

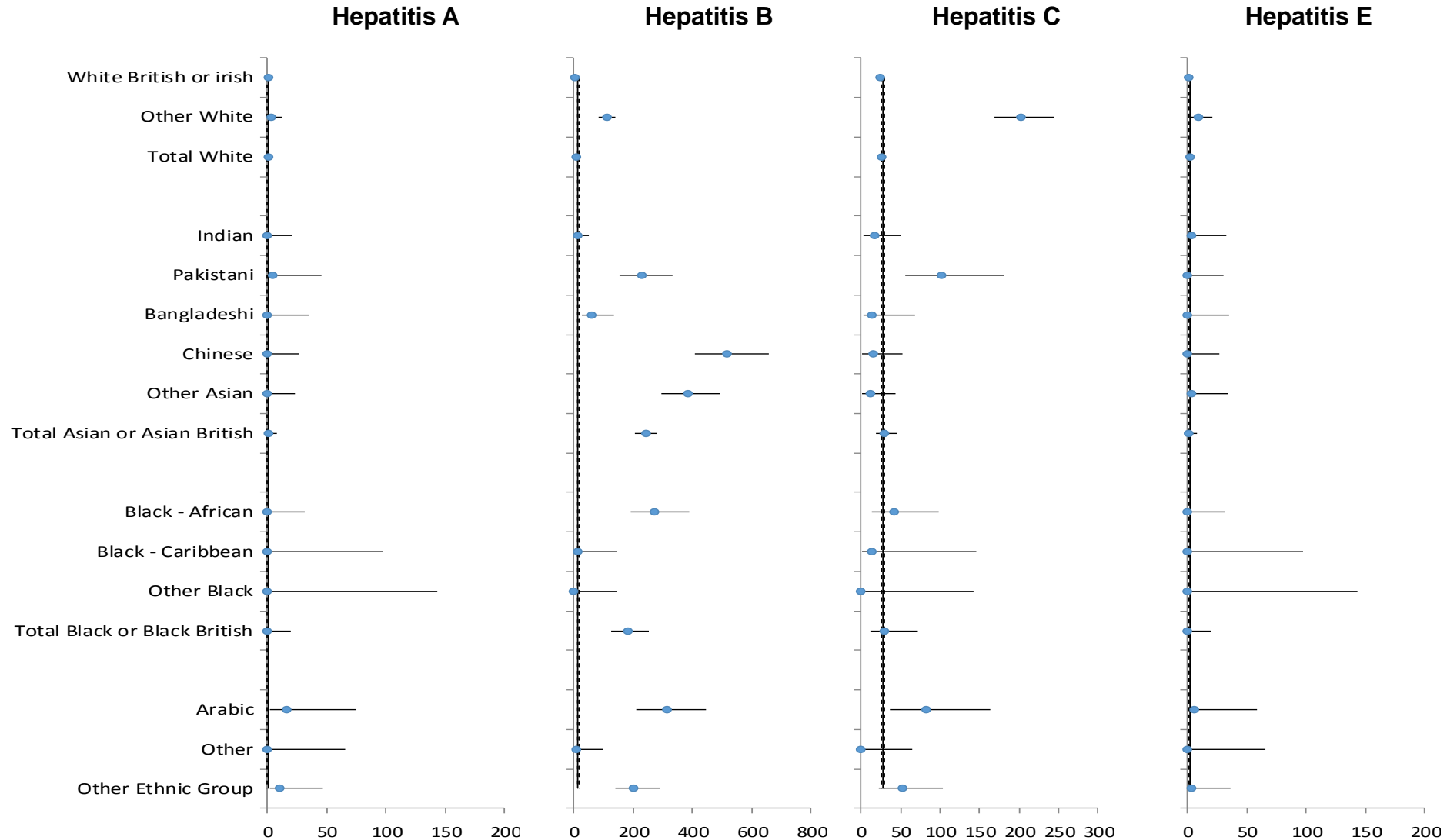
### **Methods**

1. We used ‘Onomap’ to assign ethnicity to laboratory confirmed cases of viral hepatitis in Wales, and explored variation in testing and notification rates.
2. Testing rates and positivity rates were calculated using 2011 Census population data

# Viral hepatitis in BME groups



Positive tests per 100 000 population



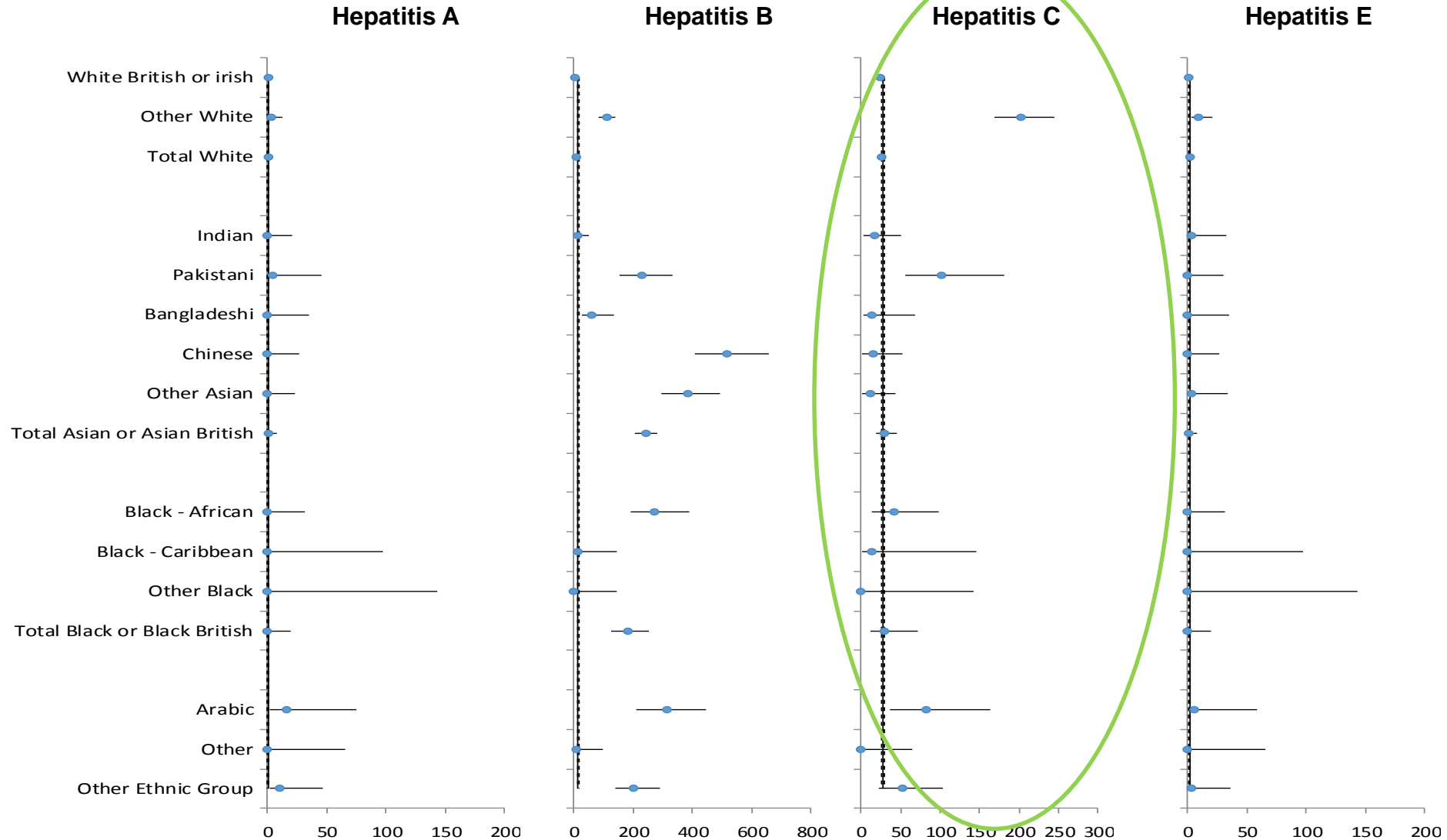
# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

Positive tests per 100 000 population



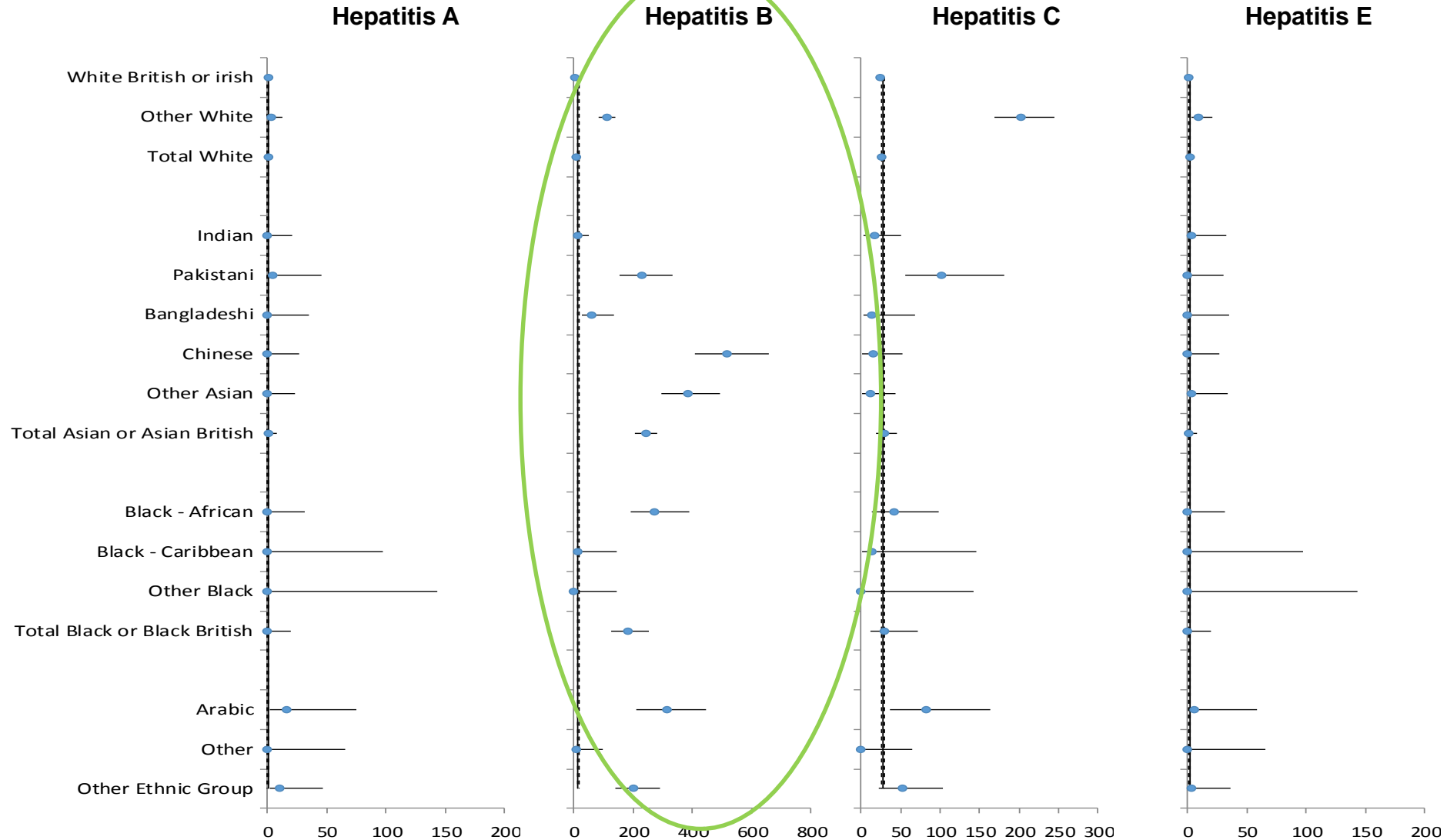
# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

Positive tests per 100 000 population



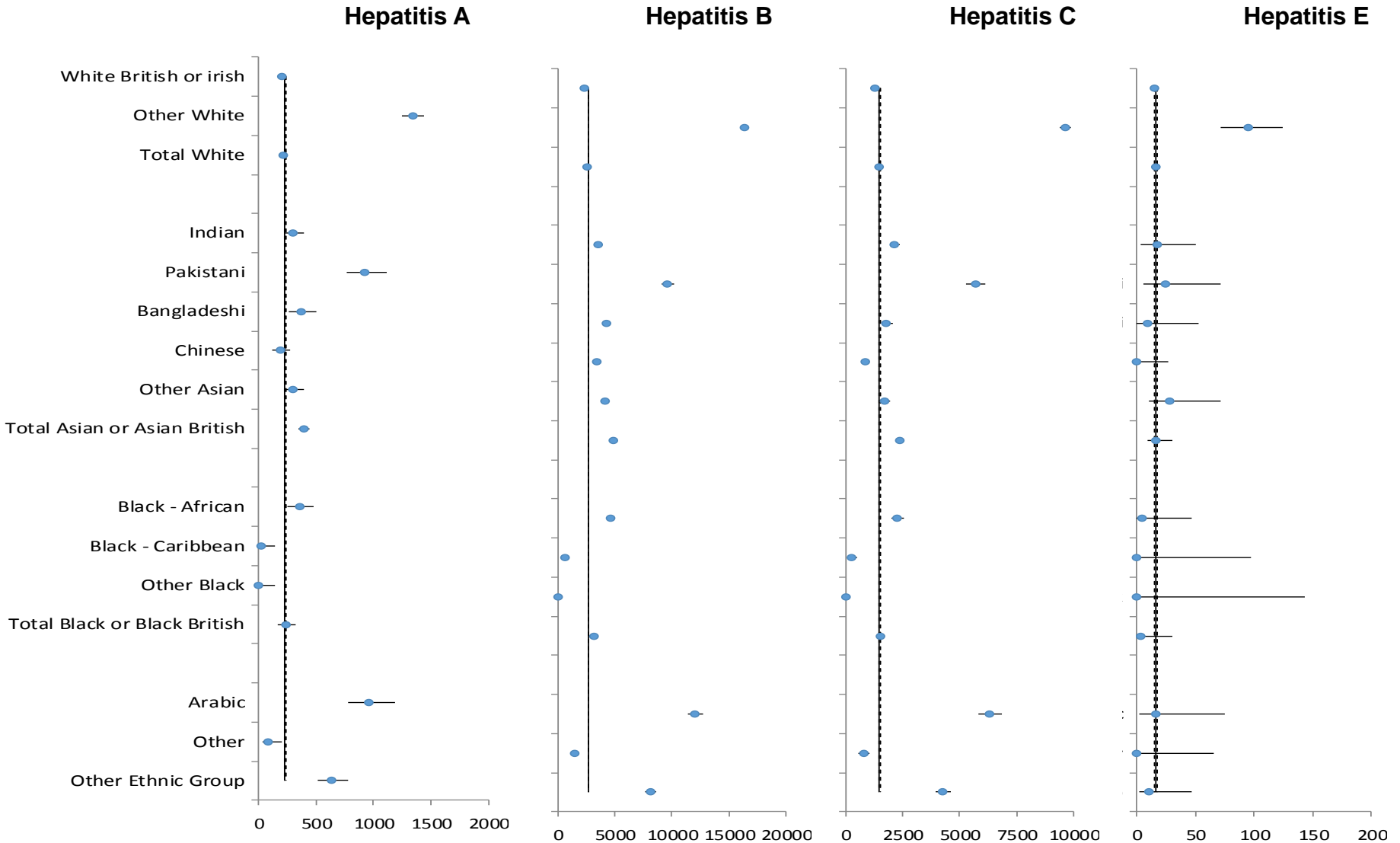
# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

## Tests per 100 000 population



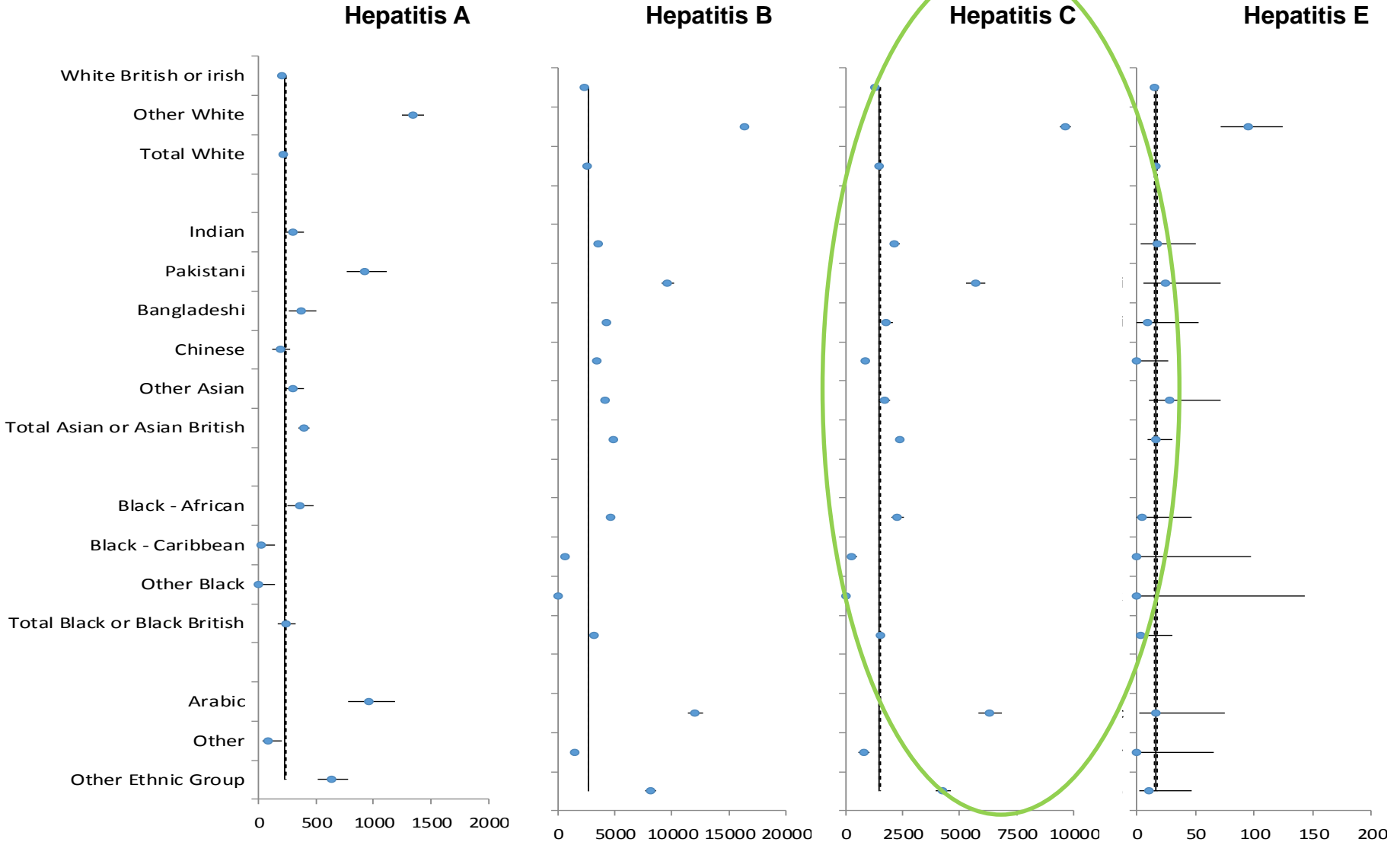
# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

## Tests per 100 000 population



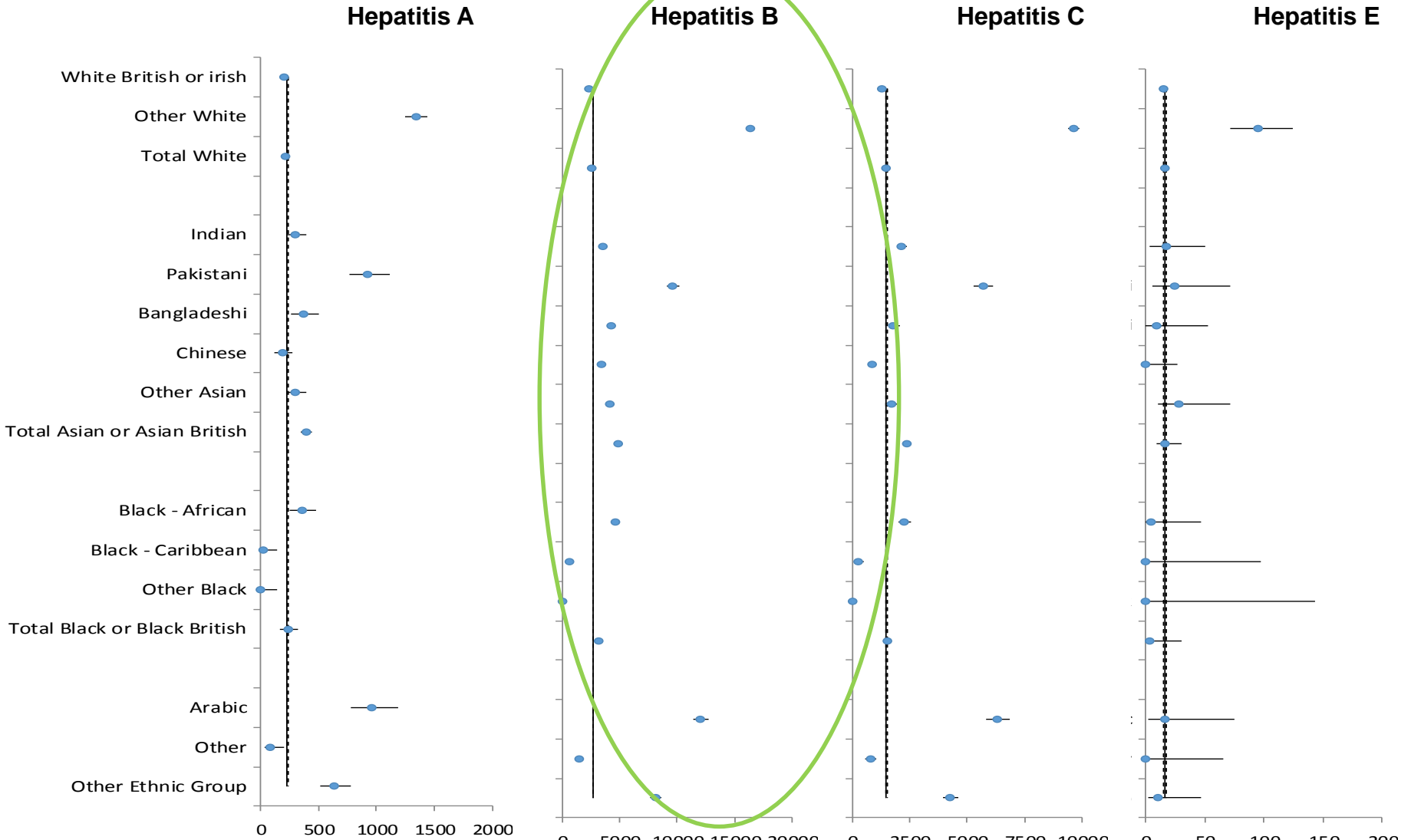
# Viral hepatitis in BME groups



GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

## Tests per 100 000 population



# Viral hepatitis in BME groups

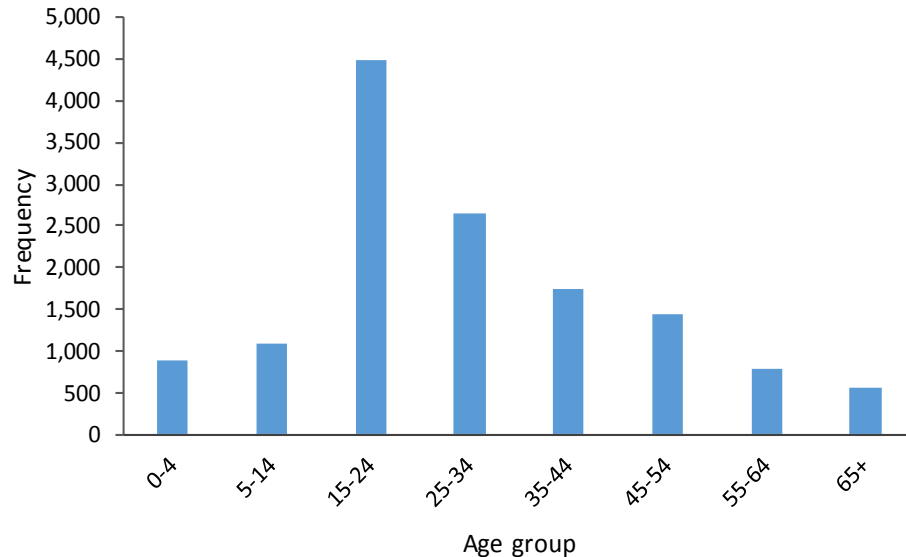


GIG  
CYMRU  
NHS  
WALES

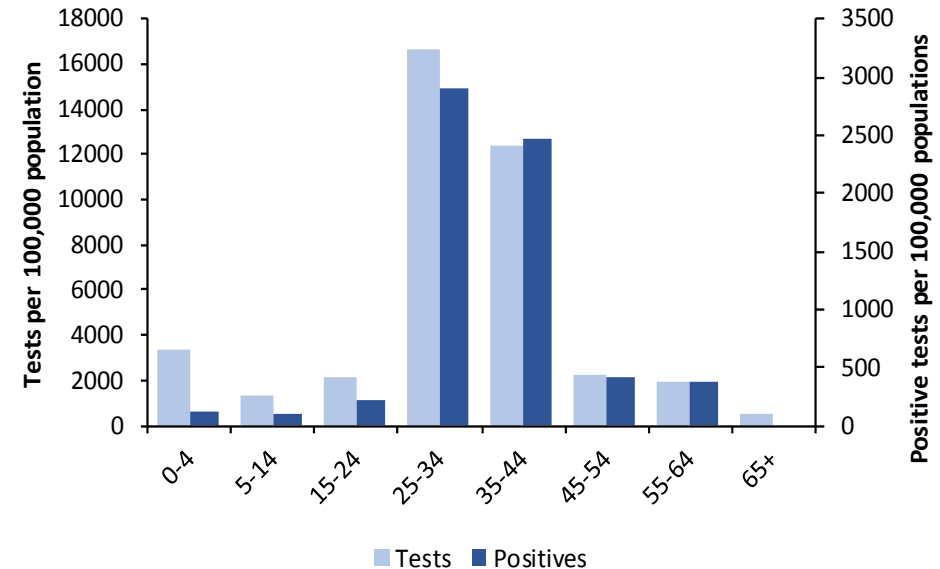
Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

## Age stratification

Age distribution of Chinese population in Wales



Age distribution of Chinese population in Wales tested for hepatitis B and proportion diagnosed positive





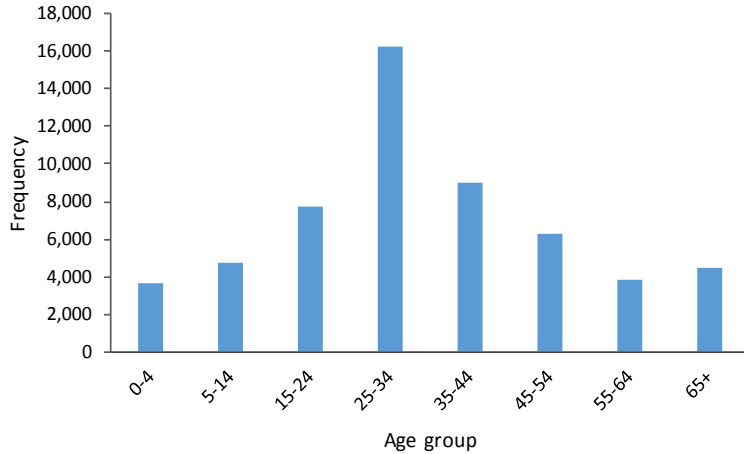
# Viral hepatitis in BME groups



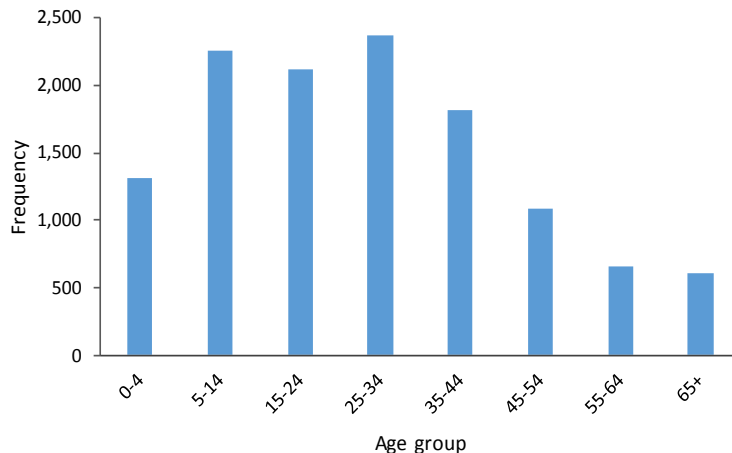
GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

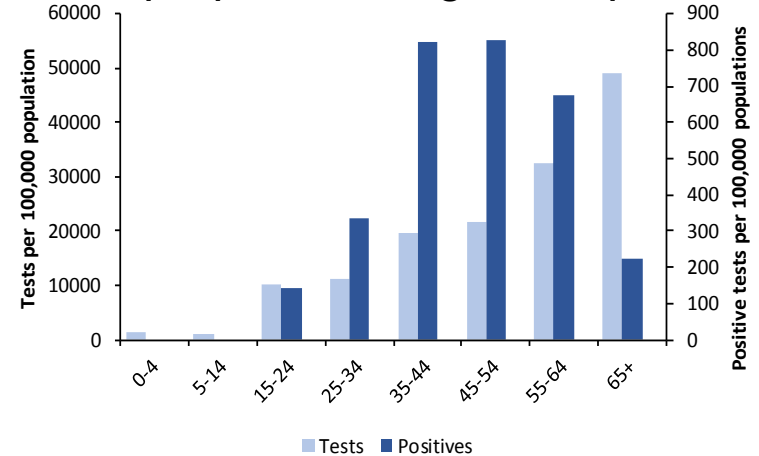
## Age distribution of 'White Other' population in Wales



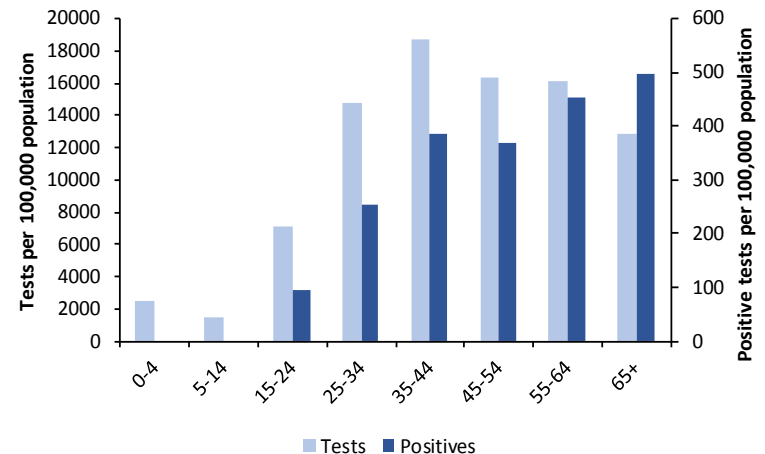
## Age distribution of 'Pakistani' population in Wales



## Age distribution of 'White-other' tested for HCV and proportion diagnosed positive



## Age distribution of 'Pakistani' tested for HCV and proportion diagnosed positive



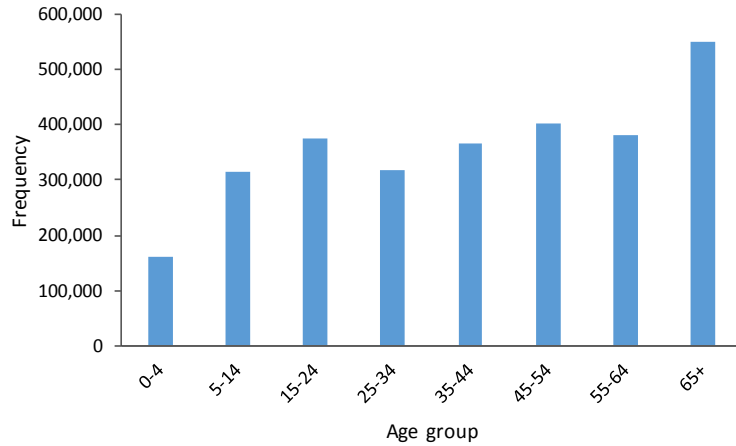
# Viral hepatitis in BME groups



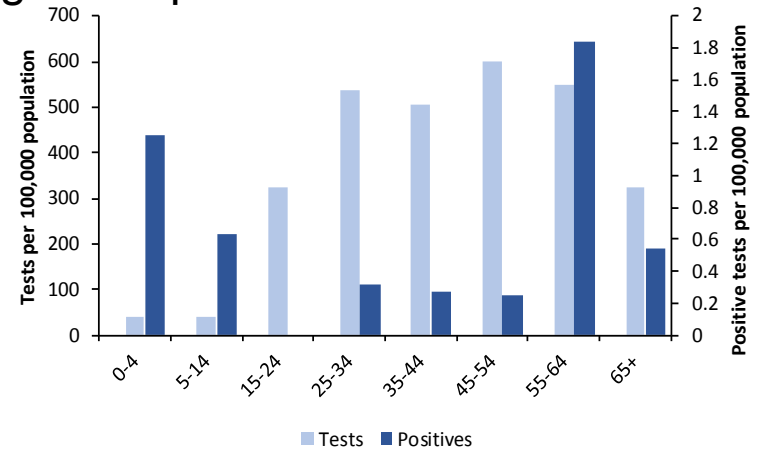
GIG  
CYMRU  
NHS  
WALES

Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

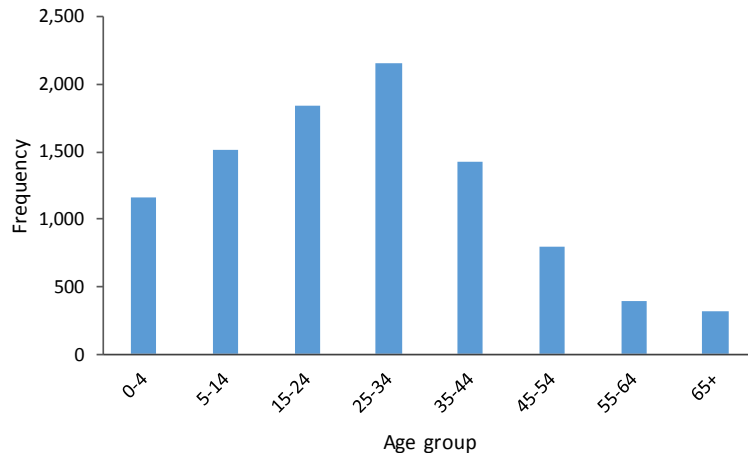
## Age distribution of 'White British/Irish' population in Wales



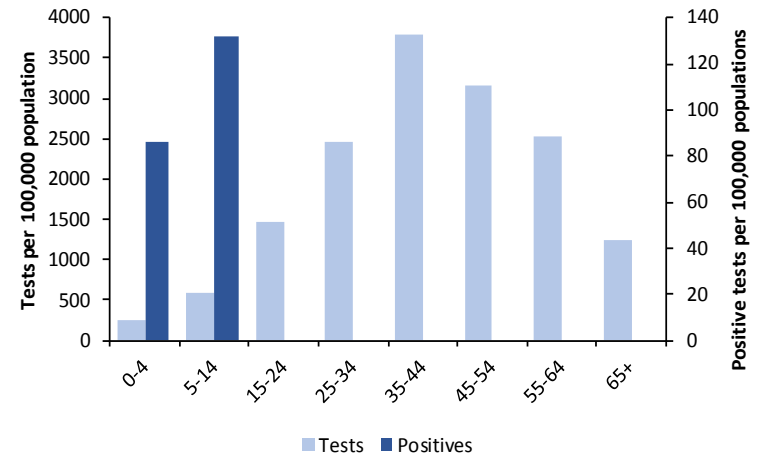
## Age distribution of 'White British/Irish' tested for hepatitis A and proportion diagnosed positive



## Age distribution of 'Arabic' population in Wales



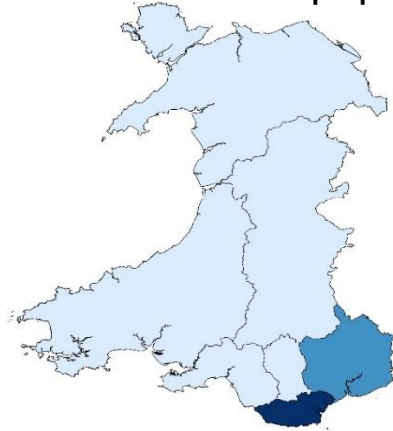
## Age distribution of 'Arabic' tested for hepatitis A and proportion diagnosed positive



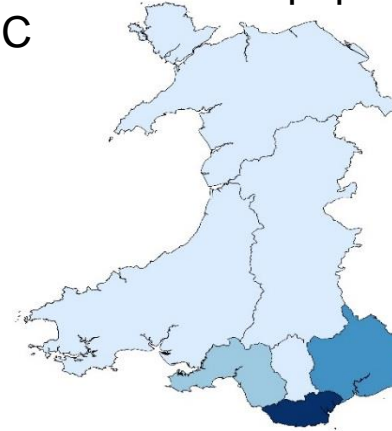


## Geographical variation?

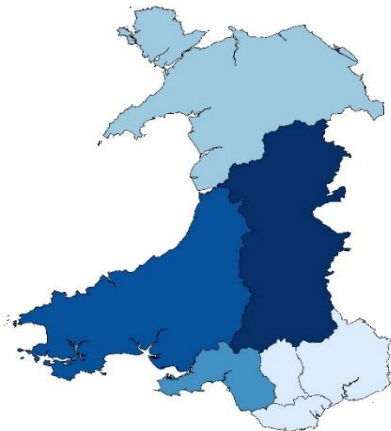
Distribution of Pakistani population in Wales



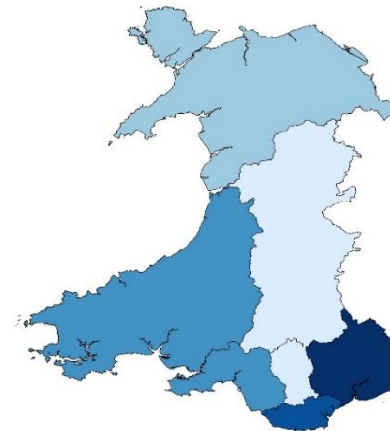
Distribution of Pakistani population tested for hepatitis C



Proportion tested for hepatitis C



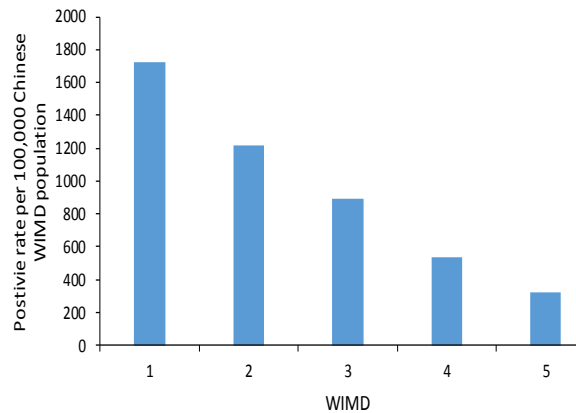
Proportion positive for hepatitis C



# Viral hepatitis in BME groups

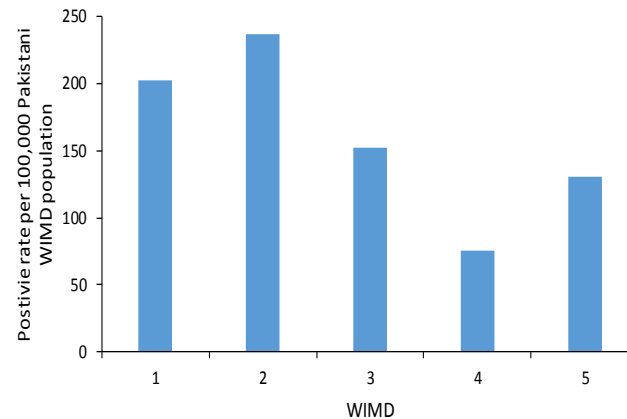
## Social gradient in proportion newly diagnosed positive?

Hepatitis B:  
Chinese population



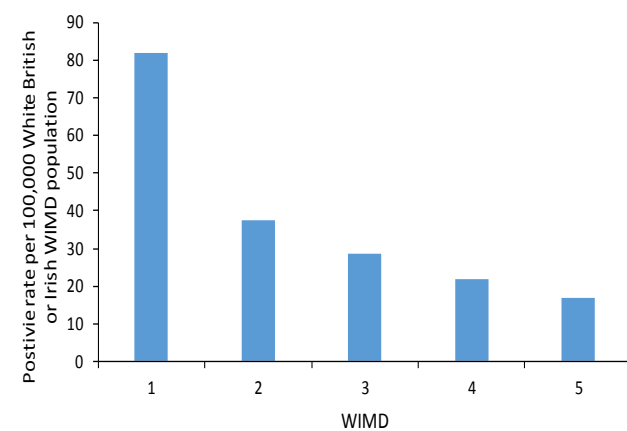
Most deprived → Least deprived

Hepatitis C:  
Pakistani population



Most deprived → Least deprived

Hepatitis C:  
White British/Irish population



Most deprived → Least deprived

# Viral hepatitis in BME groups

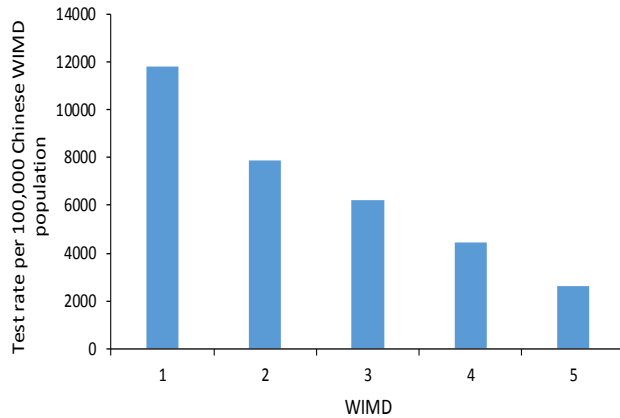


GIG  
CYMRU  
NHS  
WALES

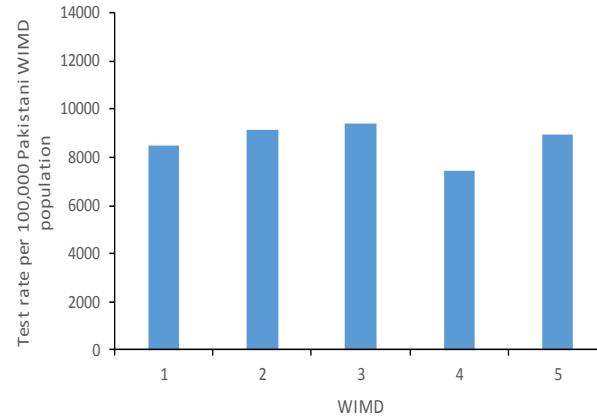
Iechyd Cyhoeddus  
Cymru  
Public Health  
Wales

## Social gradient in testing?

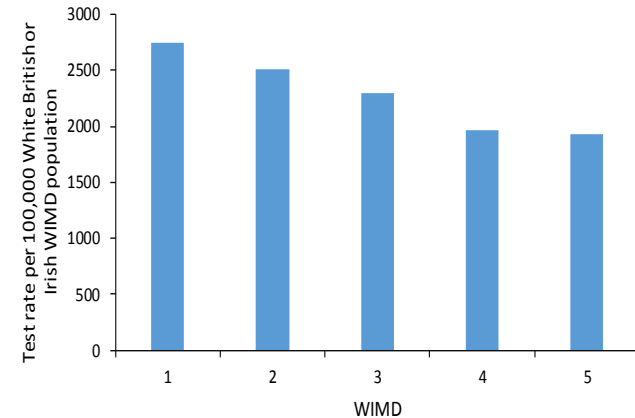
Hepatitis B tests:  
Chinese population



Hepatitis C tests:  
Pakistani population



Hepatitis C tests:  
White British/Irish population



Most deprived → Least deprived

Most deprived → Least deprived

Most deprived → Least deprived



## Key Findings

- Notifications were most frequent in 'White British', but rates were considerably higher in other ethnic groups:
  - Hepatitis A: 'Arabic' and 'Pakistani' populations,
  - Hepatitis B: 'Chinese', 'Other Asian' and 'Arabic' populations,
  - Hepatitis C: 'White – other' and 'Pakistani' groups,
  - Hepatitis E : 'White – other' group
- In general, testing rates were highest in the ethnic groups with highest notification rates, although the Chinese population living in Wales appeared to be under-tested for hepatitis B relative to their risk.
- Ethnic groups are heterogeneous. Stratified analysis of other characteristics (age, area of residence, social deprivation) can provide useful information about how best to better target services



## General conclusions

- As Wales' population becomes more ethnically diverse, variation in incidence and rates of testing for communicable disease should be closely monitored
- Onomap appears to be a good tool for doing this, although any results should be interpreted with care
- Potential for examining ethnic variation in other outcomes, such as: uptake of immunisation or screening
- Future collaboration with UCL and colleagues in Wales interested in ethnic inequalities may be possible



## Acknowledgements

**Amy Phillips**, Meirion Evans (PHW Communicable Disease Surveillance Centre), George Karani (Cardiff Metropolitan University), Janusz Janiec (Narodowy Instytut Zdrowia Publicznego), Rachel Jones (PHW Microbiology), Soma Gaur (Microbiology, Aneurin Bevan UHB), Wei Wan (Microbiology, Cwm Taf UHB), Mark Thomas (PHW Informatics), Mark Griffiths, Laura Evans (PHW Policy, Research and International Development).

**Funded by Public Health Wales Pump-priming and Strategic Initiatives Fund**