2015 Undiagnosed Estimates for WA State

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Contents

1 Summary of Results

The undiagnosed fraction declined slightly overall, and in every group. However, note that the number of both undiagnosed and total cases rose slightly in all groups.

1.1 2015

Table 1: In both tables, the MSM and KC results are separate marginal results, i.e. they are two different ways of dividing the statewide results.

Group	PLWHA	Undiagnosed Cases	True Prevalence	Undiagnosed Fraction (%)
WA State	11985	1360.0	13345.0	10.2
MSM	9071	648.2	9719.2	6.7
non-MSM	2914	711.7	3625.7	19.6
Inside KC	6661	656.5	7317.5	9.0
Outside KC	5324	703.4	6027.4	11.7

1.2 2014

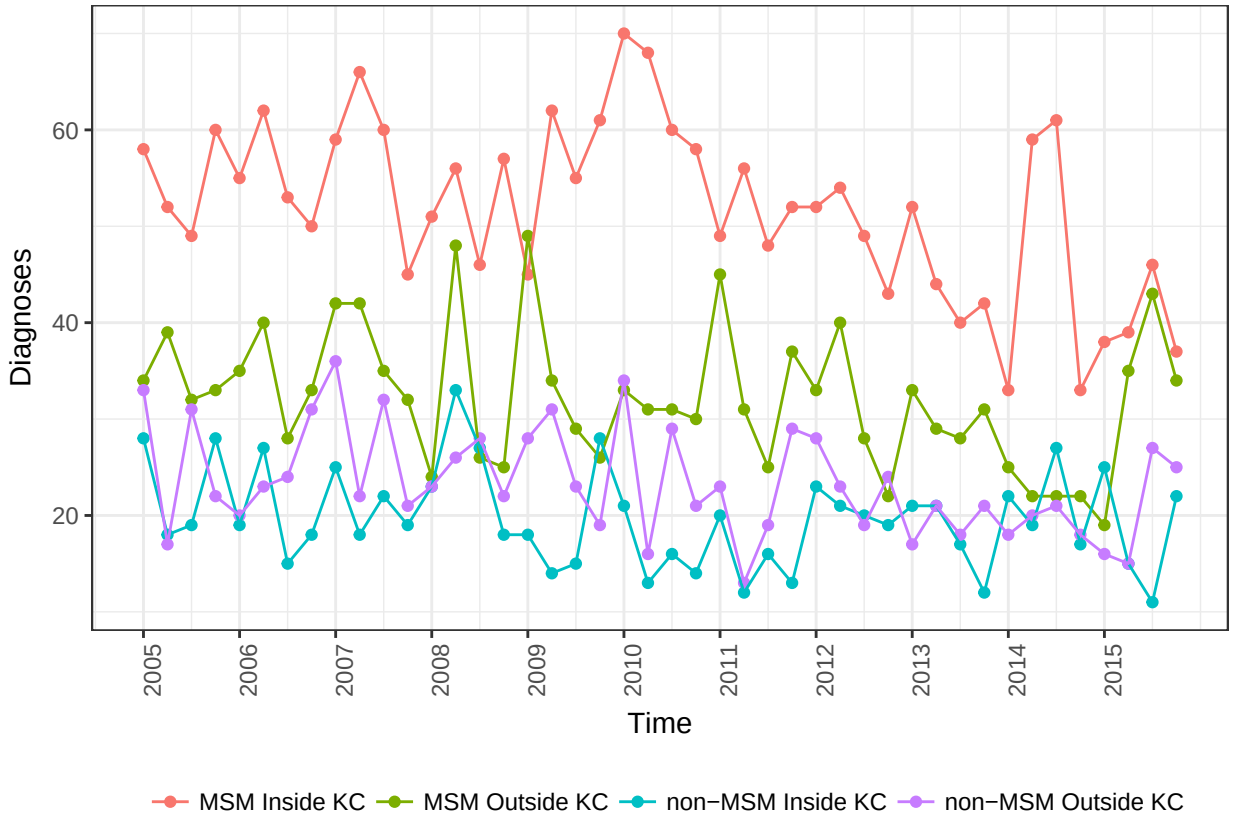
Group	PLWHA	Undiagnosed Cases	True Prevalence	Undiagnosed Fraction (%)
WA State	11637	1369.0	13006.0	10.5
MSM	8803	650.5	9453.5	6.9
non-MSM	2834	718.9	3552.9	20.2
Inside KC	6567	678.5	7245.5	9.4
Outside KC	5070	691.0	5761.0	12.0

2 Diagnoses

2.1 Analytic sample

Analytic data set has 5596 cases for 2005-2015. From the original file provided by Jason, we excluded 14776 cases based on year (excluding diagnoses prior to 2005) restrictions, and an additional 79 cases who were 16 or younger and had no observed date of LNT.

2.2 Diagnoses over time by MSM/Area subgroups



3 Subgroup Sizes and Testing Histories

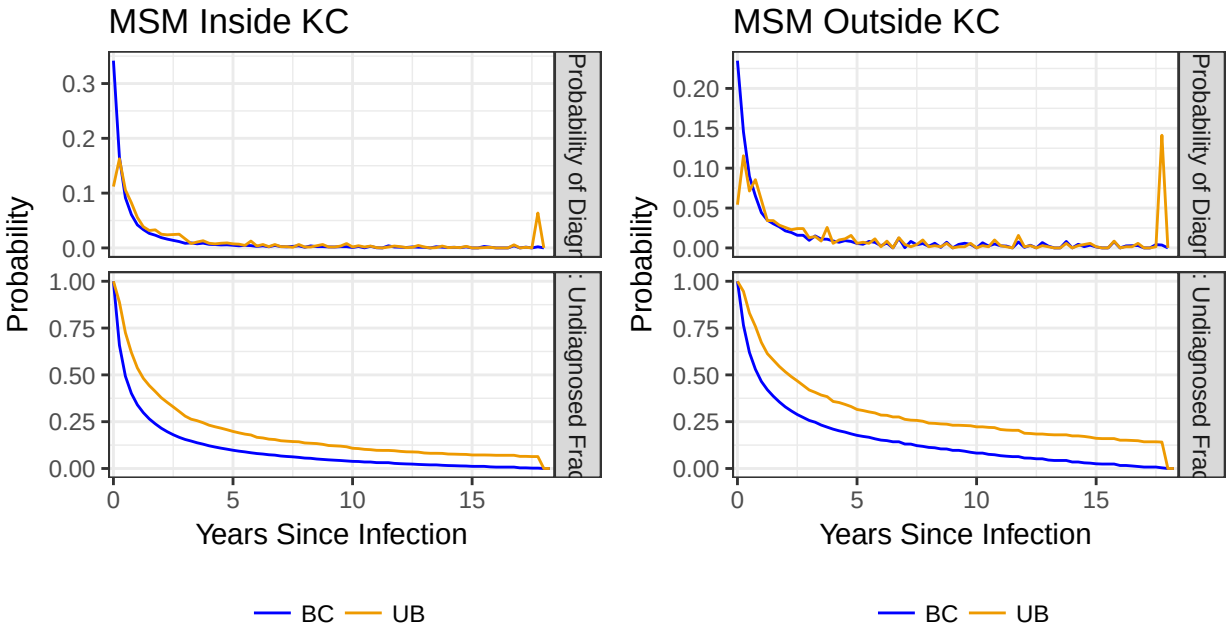
Table 3: Column Percent shows the composition of the total sample. The Percent Yes, Percent No and Percent Missing columns indicate the row percents of the three possible testing history statuses within each subgroup

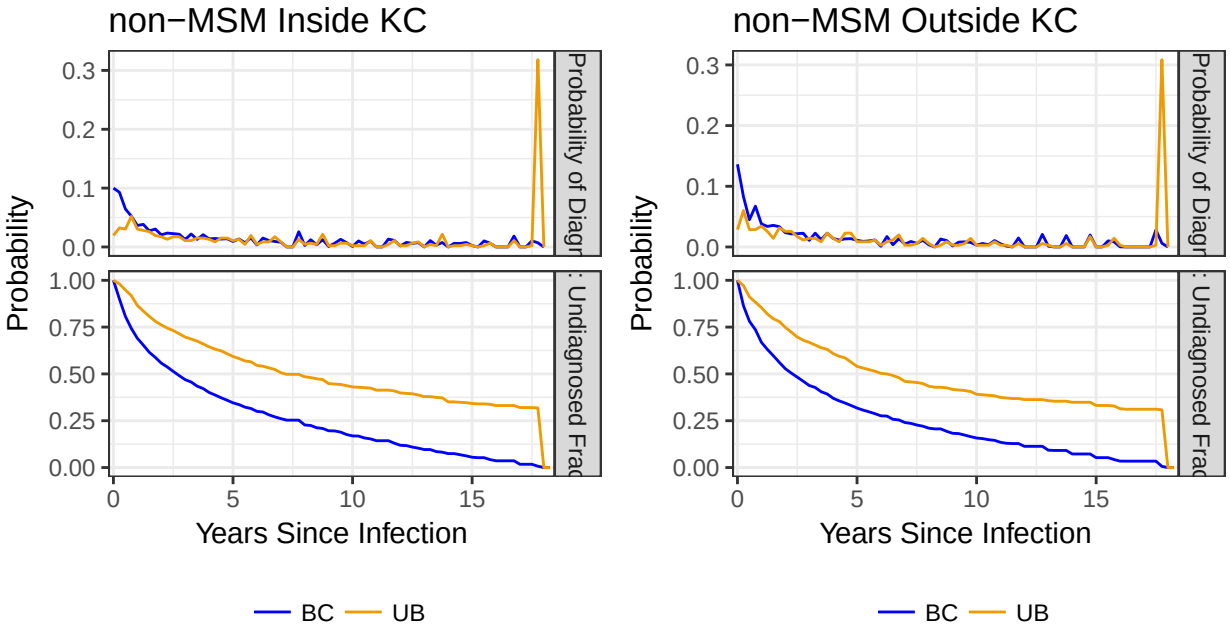
King County	Mode	N	Column Percent	Percent Yes	Percent No	Percent Missing
All	All	5596	100	46	12	42
Inside KC	MSM	2285	41	69	8	23
Inside KC	non-MSM	869	16	29	24	47
Outside KC	MSM	1415	25	38	11	50
Outside KC	non-MSM	1027	18	21	13	66

As we would expect, the presence of observed LNTs is higher for MSM than non-MSM and inside KC vs outside KC. MSM outside of KC have much lower observed LNTs (only 25%) than MSM inside KC (41%). This means that the outside-KC estimates, regardless of mode subgroup, are based on low levels of observed LNTs. This makes them particularly dependent on our 'missing at random' assumption.

4 Time from Infection to Diagnosis (TID)

The plots below show the TID curves for the four MSM/Area subgroups. BC=Base Case and UB=Upper Bound. For each subgroup, the upper plot panel is the probability of diagnosis curve (the pdf) and the lower plot panel is the survivor curve (1-cdf). The lower plot panel's y-axis thus indicates the fraction remaining undiagnosed at a given number of years since infection (x-axis).

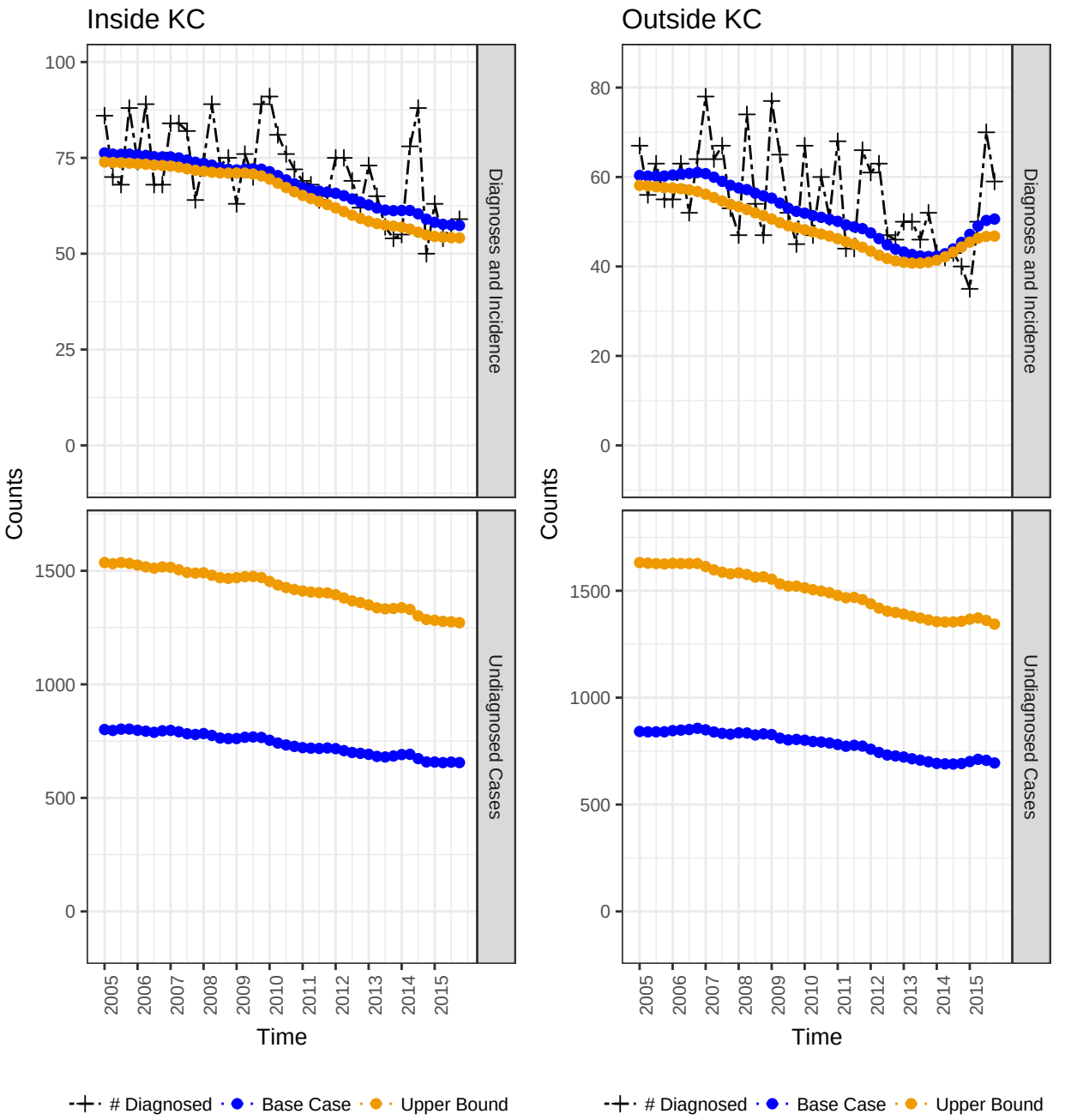




These plots correspond to what we saw in the testing history responses above. MSM outside KC have longer times to diagnosis than MSM inside KC. For example, at 2.5 years since infection, the Base Case fraction of MSM remaining undiagnosed is less than 25% inside KC but is greater than 25% outside KC. The non-MSM TIDs are more similar, with about 50% of cases remaining undiagnosed at 2.5 years.

5 Incidence and undiagnosed counts

The upper plot panels show diagnoses and estimated incidence, while the lower plot panels show undiagnosed cases. The upper panels have different y-scales.

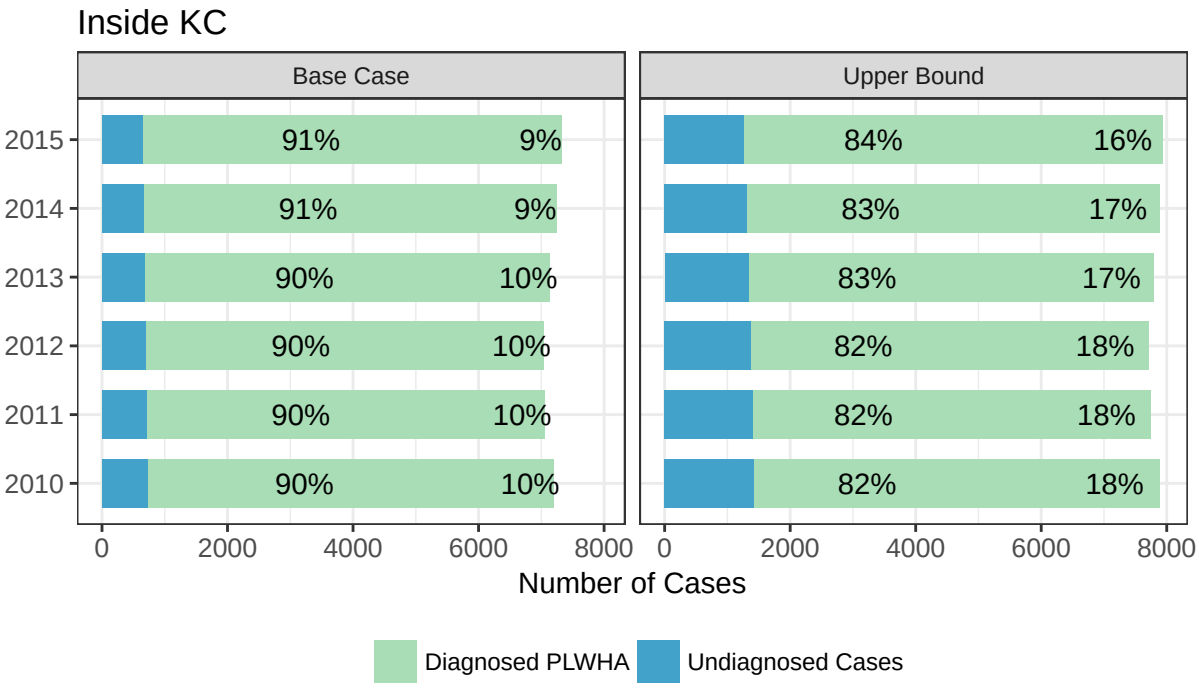


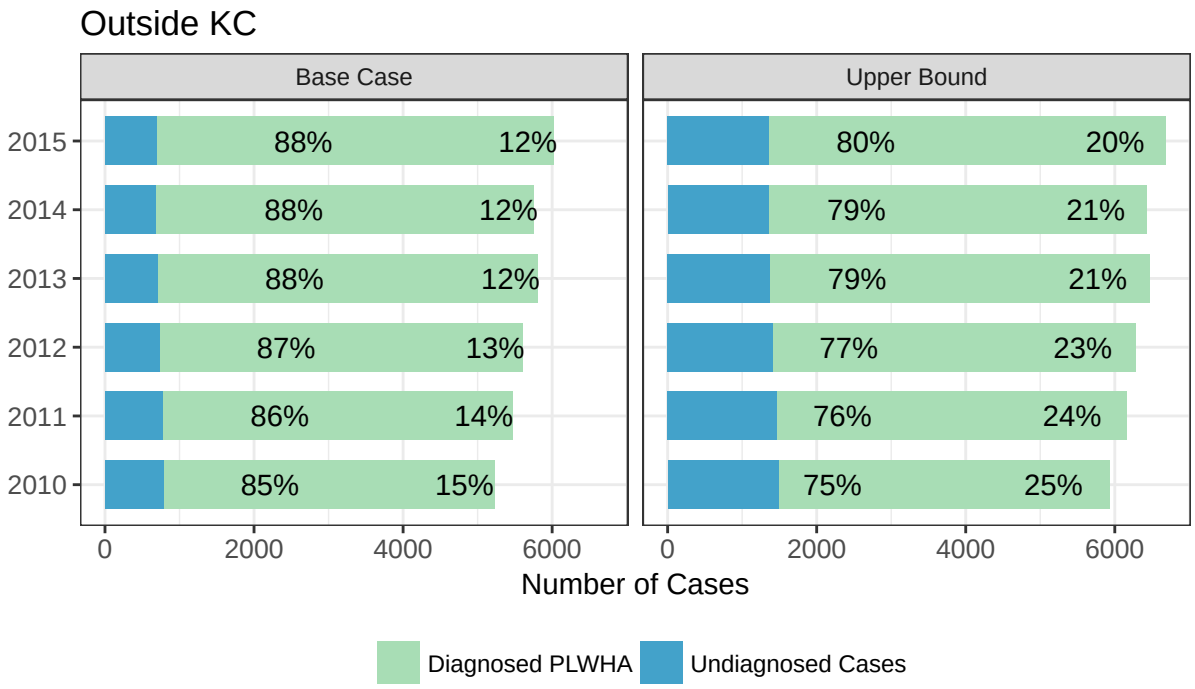
Taking the y-scales into account, you can see that the number of new diagnoses/cases each quarter is higher inside KC than outside, but the undiagnosed case counts are similar. This reflects longer times to diagnosis

outside KC than inside KC.

6 Undiagnosed fractions

These plots show the total number of PLWH (x-axis) broken down by diagnosed and undiagnosed (colors) for the Base Case versus Upper Bound estimates (panels). Undiagnosed fractions are indicated by the percent labels. There is clearly a trend of greater diagnosed PLWH over 2010-2015. If this is a function of reporting rather than a real increase, it may be masking true trends in the undiagnosed fraction as well as true differences between inside and outside KC. Again, apologies for different x-scales on the inside versus outside KC plots.




Outside KC
Base Case
Upper Bound
2015
2014
2013
2012
2011
2010
88%
12%
88%
12%
88%
12%
87%
13%
86%
14%
85%
15%
80%
20%
79%
21%
79%
21%
77%
23%
76%
24%
75%
25%
0
2000
4000
6000
Number of Cases
Diagnosed PLWHA
Undiagnosed Cases