

## Appendix : Epidemiological Framework

A prevalence rate based on parent reports identifies a case when they report that their child has received an ADHD diagnosis. This requires two events: provider access and a diagnosis from that provider. Let  $\text{Prev}(\text{ADHD})$  denote the ADHD prevalence rate based on a parent report and call the NYS PMHS sector 1 and the collection of all other providers (the non-PMHS), sector 2. Let  $\text{Prob}(A_i)$  represent the probability of accessing a provider in the  $i^{\text{th}}$  health care sector, where  $i = 1$  or  $2$  and let  $\text{Prob}(\text{ADHD}|A_i)$  represent the probability of receiving a diagnosis of ADHD given accessing care in the  $i^{\text{th}}$  sector. Then the prevalence of ADHD is equal to

$$\text{Prev}(\text{ADHD}) = \text{Prob}(A_1) \text{Prob}(\text{ADHD}|A_1) + \text{Prob}(A_2) \text{Prob}(\text{ADHD}|A_2) \quad (1)$$

This equation indicates that the true parent report based prevalence rate depends on the likelihood of accessing care in one or the other sector followed by receipt of an ADHD diagnosis in that sector.

To represent racial/ethnic specific rates in the above equation, we use the subscript W for whites and the subscript G for either black or Hispanic groups. The findings in several studies that W have higher prevalence rates than at least one of the subgroups in G in terms of equation 1 is

$$\begin{aligned} \text{Prob}_W(A_1) \text{Prob}_W(\text{ADHD}|A_1) + \text{Prob}_W(A_2) \text{Prob}_W(\text{ADHD}|A_2) > \\ \text{Prob}_G(A_1) \text{Prob}_G(\text{ADHD}|A_1) + \text{Prob}_G(A_2) \text{Prob}_G(\text{ADHD}|A_2) \end{aligned} \quad (2)$$

The findings of the current study of the NYS PMHS are that both blacks and Hispanics have higher prevalence rates than whites, i.e.,  $\text{Prob}_G(A_1) \text{Prob}_G(\text{ADHD}|A_1) > \text{Prob}_W(A_1) \text{Prob}_W(\text{ADHD}|A_1)$ . Inequality (2) can only hold if the prevalence of ADHD in sector 2 (the non-PMHS) for W is higher than the prevalence for G., i.e.,

$$\text{Prob}_W(A_2) \text{Prob}_W(\text{ADHD}|A_2) > \text{Prob}_G(A_2) \text{Prob}_G(\text{ADHD}|A_2) \quad (3)$$

Inequality (2) can hold in many ways. One way is that in sector 2, the probability of an ADHD diagnosis is independent of racial/ethnic group, i.e.,  $\text{Prob}_W(\text{ADHD}|A_2) \approx \text{Prob}_G(\text{ADHD}|A_2)$  and the likelihood of accessing sector 2 is greater for W than for G, i.e.,  $\text{Prob}_W(A_2) > \text{Prob}_G(A_2)$ . Another possibility is access is essentially equal,  $\text{Prob}_W(A_2) \approx \text{Prob}_G(A_2)$ , but whites in Sector 2 are more likely to receive an ADHD diagnosis than are members of group G's, i.e.,  $\text{Prob}_W(\text{ADHD}|A_2) > \text{Prob}_G(\text{ADHD}|A_2)$ . Of course both of these possibilities can be true as well.