

1.
$$PPV = (sensitivity * prevalence) / ((sensitivity * prevalence) + ((1 - specificity) * (1 - prevalence)))$$

$$= (8/10 * 9/100000) / (8/10 * 9/100000 + 2/10 * 99991/100000)$$

$$= 72 / (72 + 2 * 99991)$$

$$= 0.00036$$
2. Given:

$$(sensitivity * prevalence) / ((sensitivity * prevalence) + ((1 - specificity) * (1 - prevalence))) = 0.5$$

$$sensitivity = specificity$$

$$prevalence = 9/100,000$$

We solve above to have $sensitivity = specificity = 0.99991$
3. Given that NMSC incidence among Asian individuals is 2.3 to 9.2 per 100,000 population and the reported sensitivity and specificity are close to 0.8, which is similar to the settings in Question 1 and 2, the PPV of the reported models in this paper would be at very low level.