GUESSTIMATE

Question:

Estimate the number of N95 masks that will be required until 30th September 2021 due to coronavirus pandemic. (Consider India only)

Analysis :

Step 1 : Let's consider total population of India **139 Cr.**

Step 2 : As per the recent report of **Indian Express** , only **44%** of entire population use mask.

So for the entire problem we will consider only **44%** of the entire population which is **61.16 Cr**

Step 3 : Out of **61.16 Cr** population below 3 yrs children are not applicable for wearing **n95** mask and they are **~10%** of total population .

As of now lets consider 10% of the total populations are children who belong to **0-3 yrs** of age limit **(Almost 6.16 Cr. Children)**

Step 4 : So , population of India who are applicable for n95 mask are **55 Cr**

Step 5 : Out of **55 Cr.** Let's consider that **10%** people use **N95** masks rest **don't use them or are unable to afford the N95 masks because of it's higher price rate and unavailability.**

So total population who are applicable for the consumption is ~5.5 Cr.

Step 6 : As we know **n95 masks** are washable and usually people wear it for one day and wash it for necessary sanitisation**. So on an average an adult uses 5 masks/week.** ***(Considering weekend lockdown & the person is not going out everyday)***

Step 7 : While considering per head mask count , we also have to consider that age group from **3 to 10 might not need 5 masks per week as purposes for going them out is even more less** . Let's consider they consume 2 masks per week on an average.

Lets consider the population of **3-10 yrs** children are **~10%** of **5.5 Cr** i.e. **~0.55 Cr** who uses **2 masks/week on an avg.**

Step 8 : Similarly age group from **10-18 yrs** also are considerably students , so even usage of them of n95 masks are also less comparatively considering the adults **(18 - 45)Yrs.**

Let's consider population of age group from **10-18 yrs** are **~20%** of 5.5 , which is **~1.1 Cr** people and they use on an avg. **3 masks /week.**

Step 9 : Now let's consider the youth population of India which are almost **40% of 5.5 Cr who are applicable for masks.**

So Youth are in total **~2.2 Cr.** And they use almost **5 masks /week.**

Step 10 : Considering the above estimates remaining populations are considered to be **Aged/Old ,** Who are in age group **45 and above .**

So **, Population of 45 yrs & above** = 5.5 - (0.55+1.1+2.2) = **1.65 Cr.**
Which is ~30% of 5.5 Cr.

Out of **1.65 Cr .** Lets consider 1 **Cr** in range of **(45-60 Yrs)** & they consume **~3 masks /week .**

Remaining **0.65 Cr. are above 60 yrs** and they consume **1 mask/week.**

Step 11 : Let's consider n95 mask started getting consumed from April , 2020.

As per the problem statement we have to estimate consumption of n95 masks till **30th Sep, 2021 .**

So we have to consider time duration is only 18 months or 72 weeks **(2nd April , 2020 - 30th Sep, 2021)**

Step 12 : As per **N95** guidelines , we checked that one **N95** mask can be applied upto 5 times including first time use after which it has to be replaced.

Out of **72 weeks** a person needs **~15** masks on an avg , considering person uses 5 masks in a week at max. He/she starts using a new N95 mask from Monday & everyday after usage he/she washes it , in this way he/she can last with only 5 day's or max upto 1 week with one mask.

Step 13 : So , Considering the above step , we can also say

Total consumption of N95 masks over a period of 72 weeks based on weekly usage :

Avg. usage/week per person	**Total usage (72 weeks)/person**
5 masks	**~ 15 masks**
3 masks	**~ 9 masks**
2 masks	**~ 6 masks**
1 mask	**~ 3 mask**

ESTIMATE OF MASK CONSUMPTION FROM APRIL,2020 - SEPTEMBER,2021:

Age of 3-10 total n95 consumption : 0.55 * 6 : 3.3 Cr

Age of 10-18 total n95 consumption : 1.1 * 9 : 9.9 Cr

Age of 18-45 total n95 consumption : 2.2 * 15 : 33 Cr

Age of 45-60 total n95 consumption : 1.65 * 9 : 14.85 Cr

Age of above 60 total n95 consumption : 0.65 * 3 : 1.95 Cr

Total N95 mask consumption : 63 Cr (Approximately)

Along with the above analysis we also want to conclude saying that this assumption we have made considering maximum usage which is not as per practicality.

Hence we can say close to 60 Cr is the GUESSTIMATE

The entire assumption made upon few ref. as below :

https://www.newindianexpress.com/nation/2021/may/04/only-44-per-cent-of-india-is-wearing-a-face-mask-2298187.html

https://censusindia.gov.in/census_and_you/age_structure_and_marital_status.aspx