The Use of Personal Protective Equipment (PPE) During Covid-19 by Regional Health Authority

Objective

To assess use of masks, gloves and gowns before and during COVID-19 in each Regional Health Authority (RHA).

Practice Points

1. It is critical to protect front line health workers from getting infected during an epidemic. A reduction in health care workers could have a catastrophic impact on health care delivery.

2. Respiratory protection requires masks, and N95 masks are indicated for those in contact with COVID-19 or in patients at high risk of having COVID-19.

3. When facing a new pathogen, it is necessary to protect health care workers at the highest level until its epidemiology is understood. However, it is possible that during COVID-19 use of specialized PPE was high when the risk of coming in contact with COVID-19 was very low or absent, especially as the coronavirus was eradicated from the community after 6 weeks of the epidemic.

4. During COVID-19 the supply of some PPE was tenuous, and in future months this may continue. Lack of PPE could also be catastrophic for health care delivery.

5. The vast majority of cases of COVID-19 occurred in Eastern Health (EH) but incidence rate per capita was low (261/317,251 population = 0.08%). In Central Health (CH: population 91,500), Western Health (WH: population 76,500) and Labrador-Grenfell Health (LGH: population 36,300) there was little community acquired infection.

Methods

1. The daily dashboard provided by the NL Centre for Health Information (NLCHI) on PPE supplied from inventory to all departments in each RHA was analyzed. The average weekly supply was calculated from 6 Jan 2020 to 7 Mar 2020 (8 weeks pre-COVID-19) and compared to average weekly supply from 8 Mar to 31 May, 2020 (last week before and 11 weeks during the COVID-19 epidemic). The rate/1,000 population of PPE was calculated to facilitate comparisons between RHA.

Results

Table 1. Weekly Quantity of PPE by RHA

Weekly Quantity	EH	CH	WH	LGH
N95 masks				
Pre-COVID-19	2,679	1,149	516	641
During COVID-19	6,714	617	1,492	605
% increase	151	-46	189	-5
Other masks/shields				
Pre-COVID-19	12,571	444	1,305	41
During COVID-19	18,371	1,606	1,825	682
% increase	46	262	40	1,563
Gowns				
Pre-COVID-19	11,619	1,146	3,038	662
During COVID-19	27,113	2,361	3,827	1,570
% increase	133	106	26	137
Gloves				
Pre-COVID-19	51,703	1,888	4,672	-
During COVID-19	111,311	5,792	8,023	-
% increase	101	207	72	-

* excluding earloop masks and alternate rating masks

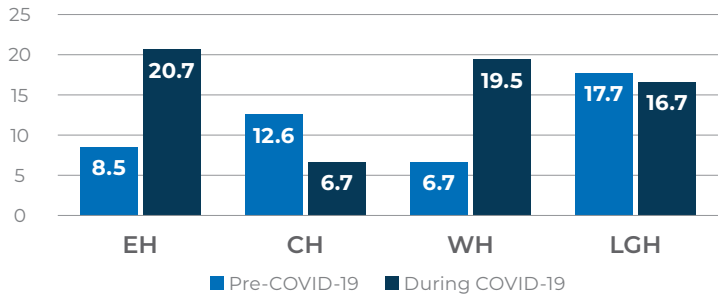

Figure 1. Quantity per 1,000 Population of N95 Masks, Pre and During COVID-19, by RHA

- Likely low rate in CH related to poor capture of data in CH during epidemic and also close management of supply by PPE committee.

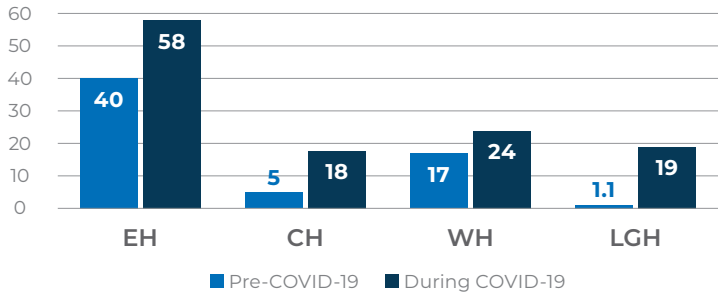

Figure 2. Quantity per 1,000 Population of 'Other' Masks, Pre and During COVID-19, by RHA

**excludes earloop and alternate rating masks*

- Low use of 'other' masks in CH and LGH pre-COVID-19. High use in EH pre and during COVID-19.

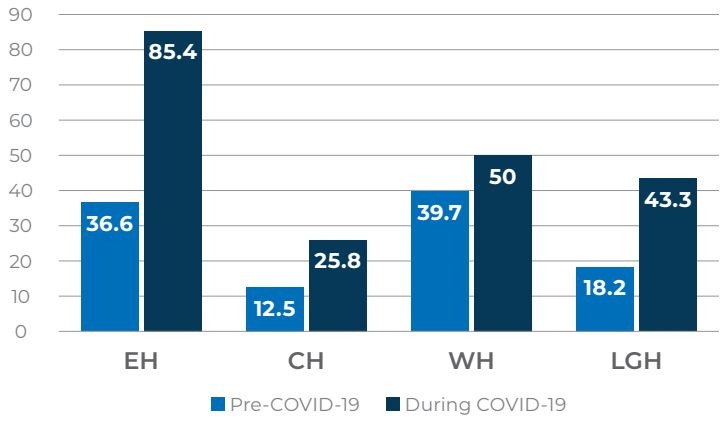

Figure 3. Quantity per 1,000 Population of Gowns, Pre and During COVID-19, by RHA

- Low rate in CH pre-COVID-19 likely related to poor capture of data.

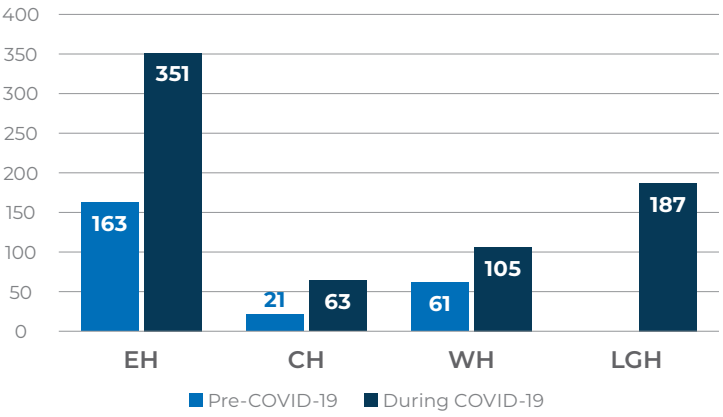

Figure 4. Quantity per 1,000 Population of Gloves, Pre and During COVID-19, by RHA

- High use of gloves both pre and during COVID-19 in EH for uncertain reasons.

Conclusions

1. Substantial and sustained increase in use of PPE occurred during the first twelve weeks of COVID-19, not only in EH exposed to a cluster of cases, but in RHAs with little exposure.

2. EH is different from the other RHAs because of the presence of tertiary hospital care and exposure to community acquired COVID-19. Nonetheless it had substantially higher use of 'other' masks and of gloves both pre and during COVID-19.

3. Although WH has 16% fewer people than CH, its use of PPE was higher. Whether this was related to better capture of data in WH or better management of supply in CH is unclear.

4. The current management of PPE is based on supply to departments, not on use within the departments. Auditing of use at bi-weekly intervals is indicated for specialized PPE whose supply is tenuous.

5. The cost of N95 masks has increased OVER 12 FOLD since the epidemic started, related to more than two fold increase in use and six fold increase in price. The average weekly cost for N95 during the epidemic was nearly $120,000, which is an annual cost of $6,240,000. Also, supply is uncertain. In addition, these masks were distributed to many departments not at risk of COVID-19. Evidence-based criteria for use of PPE should not only be developed but also monitored by appropriate committees.

6. Buying PPE is dependent on accurate capture of prior use. Consequently business-based accounting systems, rather than Meditech, should be obtained as PPE costs the province tens of millions of dollars.

7. Capture of data was unreliable because of possible failure to record transfer of PPE between RHAs, taking faulty PPE out of inventory, and obtaining PPE without recording it. Staff in the health supply sector need training to ensure accurate data capture.