### Table 1: Pre-Interview Survey Results

<table>
<thead>
<tr>
<th>Surgical Capacities Before the COVID-19</th>
<th>Range</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of surgeons (N=17)</td>
<td>17 – 229</td>
<td>57</td>
</tr>
<tr>
<td>Number of elective surgeries performed in 2019 (N=17)</td>
<td>325 – 23 126</td>
<td>2 396</td>
</tr>
<tr>
<td>Number of emergency surgeries performed in 2019 (N=16)</td>
<td>15 – 22 965</td>
<td>369</td>
</tr>
<tr>
<td>Number of outpatient visits (N=16)</td>
<td>2 031 – 560 000</td>
<td>25 085</td>
</tr>
</tbody>
</table>

**Average Change in the Volume of Surgical Services in the First Nine Months of 2019 and the First Nine Months of 2020 (N=6)**

<table>
<thead>
<tr>
<th>Service</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of elective surgeries</td>
<td>-38%</td>
</tr>
<tr>
<td>Number of emergency surgeries</td>
<td>38%</td>
</tr>
<tr>
<td>Number of outpatient visits</td>
<td>-55%</td>
</tr>
</tbody>
</table>
Table 2 – Summary of COVID statistics corresponded with interview date

<table>
<thead>
<tr>
<th>Number of positive COVID-19 cases per 10,000 population at time of interview</th>
<th>Hospital Code</th>
<th>Number of COVID-19 deaths at time of interview</th>
<th>Number of new COVID-19 cases per day at time of interview</th>
<th>Trend of COVID-19 infections</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 5</td>
<td>H25</td>
<td>35</td>
<td>1 (0.09%)</td>
<td>Low throughout, small peaks in Aug 20 and Jan 21</td>
</tr>
<tr>
<td></td>
<td>H1</td>
<td>0</td>
<td>0</td>
<td>sporadic increase</td>
</tr>
<tr>
<td></td>
<td>H2</td>
<td>0</td>
<td>0</td>
<td>sporadic increase</td>
</tr>
<tr>
<td></td>
<td>H10</td>
<td>59</td>
<td>22 (0.62%)</td>
<td>first wave Mar-Apr 20, second wave Dec-Feb 21</td>
</tr>
<tr>
<td></td>
<td>H22</td>
<td>13</td>
<td>76 (1.47%)</td>
<td>Low till Oct 20, then increasing</td>
</tr>
<tr>
<td></td>
<td>H11</td>
<td>444</td>
<td>987 (5.55%)</td>
<td>Initially low, start of rise in Sept, Peak Nov, decreasing thereafter</td>
</tr>
<tr>
<td></td>
<td>H20</td>
<td>159</td>
<td>563 (3.6%)</td>
<td>Low till Sept 20, then increasing</td>
</tr>
<tr>
<td>6 - 10</td>
<td>H21</td>
<td>236</td>
<td>1240 (4.67%)</td>
<td>Low till Sept 20, then increasing</td>
</tr>
<tr>
<td></td>
<td>H12</td>
<td>1199</td>
<td>1331 (2.71%)</td>
<td>Initially low, start of rise in Sept, Peak Nov, decreasing thereafter</td>
</tr>
<tr>
<td></td>
<td>H3</td>
<td>10 473</td>
<td>3509 (1.28%)</td>
<td>increasing</td>
</tr>
<tr>
<td></td>
<td>H4</td>
<td>10 740</td>
<td>4284 (1.52%)</td>
<td>increasing</td>
</tr>
<tr>
<td>11 – 20</td>
<td>H5</td>
<td>12 027</td>
<td>3906 (1.16%)</td>
<td>increasing</td>
</tr>
<tr>
<td></td>
<td>H6</td>
<td>12 959</td>
<td>4432 (1.19%)</td>
<td>increasing</td>
</tr>
<tr>
<td></td>
<td>H13</td>
<td>6535</td>
<td>624 (0.2%)</td>
<td>First wave May-Jul 20, Second wave Nov-Jan 21</td>
</tr>
<tr>
<td>21 - 30</td>
<td>H23</td>
<td>5818</td>
<td>1436 (0.36%)</td>
<td>Relatively high throughout, first peak Jun 20, second peak Nov/Dec 20</td>
</tr>
<tr>
<td></td>
<td>H24</td>
<td>5861</td>
<td>1493 (0.47%)</td>
<td>Relatively high throughout, first peak in Jun 20, Second peak in Nov/Dec 20</td>
</tr>
<tr>
<td></td>
<td>H14</td>
<td>5925</td>
<td>2804 (0.865)</td>
<td>Constant increase</td>
</tr>
<tr>
<td></td>
<td>H15</td>
<td>5295</td>
<td>2804 (0.865)</td>
<td>Constant increase</td>
</tr>
<tr>
<td>31 - 40</td>
<td>H16</td>
<td>6449</td>
<td>2823 (0.53%)</td>
<td>Constant increase</td>
</tr>
<tr>
<td></td>
<td>H17</td>
<td>6449</td>
<td>2823 (0.53%)</td>
<td>Constant increase</td>
</tr>
<tr>
<td></td>
<td>H18</td>
<td>6690</td>
<td>1606 (0.45%)</td>
<td>Constant increase</td>
</tr>
<tr>
<td></td>
<td>H19</td>
<td>6690</td>
<td>1606 (0.45%)</td>
<td>Constant increase</td>
</tr>
<tr>
<td>41 - 50</td>
<td>H7</td>
<td>96 318</td>
<td>70 589 (1.16%)</td>
<td>increasing till mid-Sept then decreasing</td>
</tr>
<tr>
<td></td>
<td>H8</td>
<td>99 773</td>
<td>81 484 (1.29%)</td>
<td>increasing till mid-Sept then decreasing</td>
</tr>
<tr>
<td></td>
<td>H9</td>
<td>103 569</td>
<td>61 267 (0.92%)</td>
<td>increasing till mid-Sept then decreasing</td>
</tr>
</tbody>
</table>
Table 3 – Summary of thematic findings on “Impact on Surgical services”

<table>
<thead>
<tr>
<th>Emergency surgical services</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Emergency surgical services were kept running</td>
</tr>
<tr>
<td>“The emergency admissions were there, emergency operations were always going on” (H23)</td>
</tr>
<tr>
<td>• Oncology surgeries were given the same level of prioritization as emergency surgeries/reclassified as emergency surgeries</td>
</tr>
<tr>
<td>“We were asked to reduce our elective surgical procedures prioritising the cancer cases and surgical emergencies” (H22)</td>
</tr>
<tr>
<td>“Cancer patients, we usually admit the patients through outpatient department. But if we delay the operation, that cancer will be more aggressive. So we had to admit those patients during that period through emergency department,” (H23)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Changes in pattern of surgeries include -</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Fewer traumas from road traffic accidents during national lock-down</td>
</tr>
<tr>
<td>“During that period, yes, the emergencies that were resulting from traffic accidents went down. Because people were not on the road so there weren’t many accidents” (H21)</td>
</tr>
<tr>
<td>• Increase in obstetrics and gynaecology surgeries</td>
</tr>
<tr>
<td>“So the number of caesarean section is now increasing in our emergency department, because they referred from other provincial hospitals to our hospital in this pandemic. That’s why the number of emergency cases not decreasing, but increasing.” (H5)</td>
</tr>
<tr>
<td>• Increase in semi-emergent gastrointestinal surgeries</td>
</tr>
<tr>
<td>“There were certain changes we have noticed during this lockdown period. There were slight increase in emergency and semi emergency non trauma surgery. Patients with something like obstruction hernia” (H8)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elective surgical services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Varying degrees of closure due to -</td>
</tr>
<tr>
<td>• Government directive</td>
</tr>
<tr>
<td>“When the lockdown was imposed, in the third week of March, we had to shut down all elective operations” (H16)</td>
</tr>
<tr>
<td>“The government announced for total OPD closure from March almost up to the middle of May, and all elective surgery were cancelled or postponed or stopped” (H8)</td>
</tr>
<tr>
<td>• Manpower shortage – especially nurses and anaesthetists</td>
</tr>
<tr>
<td>“Nurses with expertise are moved by management to COVID areas. Surgery cannot be done smoothly as the dedicated nurse for the specific type of surgery is not there” (H6)</td>
</tr>
<tr>
<td>“We did not have enough nurses, even our OR nurses were deployed to the intensive care units for COVID and COVID wards. So all the elective services were stopped.” (H16)</td>
</tr>
</tbody>
</table>
“A lot of staff deserted the hospital. They left their job. Nurses especially. They got panicky; they said they will not do job, they were worried, they resigned, and then they left the hospital.” (H8)

- Resource shortages – personal protective equipment, COVID testing

“The time between the test and the result is still three to five days and that is unsatisfactory for us. The third one is PPE. Sometimes to feel more safe, we have to procure our own PPE and N95.” (H6)

“We were concerned about the adequacy of the PPEs at the time” (H16)

“During the peak season of the COVID, we didn’t have enough facilities for the RTPCR, and our government did not allow for the antigen test. So, we actually based on the symptom checks. Then, actually, we tried to avoid admitting the patients.” (H23)

- Hospital capacity shortage

“We actually were given three wards that will only accommodate 50 for all the surgical departments and we were reserving this for the emergencies.” (H16)

- Resource conservation – Personal protective equipment, blood products

“We certainly did give instructions, not to perform any surgeries that that anticipating significant blood loss.” (H21)

### Outpatient surgical services

Decrease in outpatient surgical consultations due to -

- Daily quota on outpatient consultations for crowd control
- Restriction on accompanying companions
- Patients’ fear, doctor’s fear

“It’s due to patients not showing up, they don’t want to seek consultation face to face and also the doctors, they didn’t want to come to clinics for fear of, you know, COVID” (H15)

“They were really scared to come to the hospital. They think that they might contract COVID when coming to hospital.” (H8)

- National movement restriction orders

“Yeah. biggest worry is that many of our patients were untreated during this time... we operated a patient, that patient was then went to her home, very distant place in Bangladesh. We told her to come for follow up, but she could not come. She did not have any of the follow up in last 10 months” (H23)

- Government directive

“The government announced for total OPD closure from March almost up to the middle of May, there was no OPD patient, as well, and all elective surgery were cancelled or postponed or stopped” (H8)

Changes in pattern of outpatient surgical consultations include -

- Increase in affluent patients

“Patients have increased in every hospital, even in provincial hospitals. Before this, businessmen used to leave the country to Thailand or Singapore for treatment. But now that borders are closed, they stay in the country and we see our surgical numbers increasing” (H2)
Increase in complications due to delays in seeking medical attention

“Main issue for me as a digestive surgeon, is that there are many cancer patients that were postponed and that creates a backlog. Because of that, many cancer patients have become more advanced than their initial presentations” (H6)

“An elderly lady who was having gallbladder stones, diagnosed in the month of February 2020, but since the lockdown was launched they were just hesitant to come to the hospital. When the lady came in the month of July, she was in sepsis.” (H8)
Table 4.1 – Summary of thematic findings on “Keeping Healthcare Workers Safe – Redesign of Facilities”

**Zoning**

- Physical separation of COVID designated and non-COVID areas
  
  “You zone infectious disease patients, and you don't allow mixture, not just of the patients, but also the manpower as well as the things materials that you use in the wards” (H16)

  “So we decided that in GNRC out of the four campuses, one campus will make it a dedicated COVID campus so that we don't have to mix up with other patients.” (H8)

  “All surgeons are taking the precautions of international protocols and some of the floors we are dedicated for the COVID patients and some of the lifts are also dedicated for the COVID patients.” (H24)

- Reallocation of operating theatres, intensive care units and wards for COVID designated use

  “We have two wings, separate OR complex for COVID, and we have a separate complex for non-COVID.” (H16)

  “The role of general ICU was converted to COVID ICU” (H24)

- “Float zones” for temporary holding of patients awaiting COVID status

  “While waiting for the test result the patient would be moved to the infectious disease department where they will be in isolation in quarantine until they received two successive negative test results, at which point they will be moved to another department for treatment.” (H25)

**Management of traffic flow**

- Segregated entrances and exits for COVID zones and non-COVID zones

  “Even to bring the patients from the emergency department to the operating theatre, we actually mapped out a separate pathway. We have our own internal police and they helped to clear the pathways for us when we needed to transport patients.” (H21)

  “You can also make use of some buildings that are standalone with separate entrance, to serve as your COVID area. You can just add it on in a modular manner. You don't want to use the elevator for the non COVID, to be used by patients with COVID.” (H16)

- Segregated donning and doffing areas in operating theatres

  “Even had separate pathways for staff to enter and leave the operating theatres” (H21)

**Environmental design**

- Installation of negative pressure systems in COVID-designated operating rooms

  “We have to institute facilities re-engineering, like example setting up negative pressure rooms, HEPA filter in the operating theater etc” (H14)

- Installation of air filters/purifiers

  “We opened our clinic after some engineering, air exchange, computation and institution of ventilation mechanisms” (H16)
New facilities

- Central telemedicine facilities

“We came out with this COVID operation centre. So this is like a call centre which had 20 computers there.” (H16)

“We are in the process of developing a virtual clinic. We just received a grant to develop a virtual clinic. The intention of this virtual clinic, we were hoping that we will be able to take care of the rest of the 30% of the patient that we are still not able to see” (H20)

- Temporary COVID screening facilities outside of hospital’s premises

“We have built a new centre there that we call the fever clinic. In the fever clinic there is a COVID test centre. So they go there and they can have a test.” (H24)

“We built like semi permanently building in the emergency in the parking area to make or to select what is the probable COVID cases” (H5)

- Temporary buildings to meet increased need for facilities

“We organise a hospital, for a field hospital for infectious disease at a separate location in the hospital. At the field hospital we also situated one surgery theatre designed to operate to provide surgery, to SARS-COVID infected patients suspected of infection by SARS-COVID2, if the need for emergency surgery arise” (H25)

- On-site housing for staff

“ We made a new initiative. So for those who are a bit worried, especially for those staying with family or staying with a friends, we provide the temporary facilities for them for 14 days in a nursing hostel.” (H20)

- On-site RT-PCR testing

“During the start of the pandemic, our hospital was not yet equipped with an RT PCR but right now, our hospital now has an RT PCR machine that makes it easier for us to screen patients” (H14)

Innovation

- Robotics

“We also use robotics to deliver food or medicine or medical supply to the COVID patients in the COVID ward” (H10)

- Portable negative pressure chambers

“Small chamber covering half the body of the patient, connected to negative pressure with HEPA filter to purify the air or generated aerosols during endoscopic procedures. It took three months for development” (H10)

Table 4.2 – Summary of thematic findings on “Keeping Healthcare Workers Safe – Implementation of Infection Control Protocols”

Personal Protective Equipment (PPE) policies

- Quality control of personal protective equipment
“Market was flooded with fake 95 and KN95 even during the pandemic. Testing revealed that it’s no better than a surgical face mask. So we have shifted actually to providing our surgical residents reusable elastomeric masks for interests of sustainability and protection” (H16)

- Differing levels of personal protective equipment depending on exposure risk
  - Highest level of protection: Hazmat suits/PAPR, coveralls, gloves, boots
  - Second level: N95 mask, face shield/goggles, coveralls, gloves, boots
  - Third level: Surgical mask, face shield/goggles, gown

Operating theatre workflow
- Mandated time lapse between induction of anaesthesia and admission of surgical team into operating theatre
  “We had a protocol for when the anesthetists would be entering the theatre during the intubation. So there was a delay between completion of intubation and surgeons entering.” (H21)
- Restrict personnel allowed in theatre during induction of anaesthesia/surgery
  “We set up a local protocol to minimise the number of people involved in a surgery” (H22)
  “During preparation or during the patient intubation by the anaesthetist, the surgeon is not in OT, he or she will wait in the waiting room.” (H5)
- Strict segregation of donning and doffing areas
  “We have separate donning and doffing areas for personal protective equipment” (H22)

Inpatient admissions and screening process
- Screening questionnaire and temperature check prior to entry into premises
  “All patients entering the hospital, must make a medical declaration at the gate. At the gate their body temperature would also be checked.” (H25)
- Oxygen saturation checks
  “So aside from the health declaration form, the temperature is taken, their oxygen saturation is also taken.” (H14)
  - Chest x-ray or CT for surgical patients
    “So a chest x-ray would be taken and if the picture of the chest X ray would suggest that the patient has COVID, then automatically the patient will be admitted in our area 19 or COVID ward.” (H14)
    “Those patients who were planned for an emergency surgery, chest X-ray was mandatory. There was no question that the chest X-ray would not be done. Even in pregnant patients we were doing chest x-rays.” (H13)
  - COVID tests prior admission - Wide ranging from rapid antigen test, single RT-PCR to double RT-PCR
    “We started admitting the outpatient cases with a result of COVID-19. If the outpatient patient wants to be admitted, he has to do the COVID-19 test.” (H23)
“We have also required all patients for outpatient for elective surgeries to undergo an RT PCR test. So the validity of the RT PCR test is one week.” (H14)

- Ward segregation based on COVID status

“Screening of the patient starts in the fever clinic. The patients those are having fever, cough, they will be going there first. Then from there, those who are suspected of infection, they are sent for blood test, if they are positive, then they are referring to the COVID centre.” (H24)

### Outpatient visit control

- Strictly by appointment only and staggering of appointments

“So I think we decided to adopt, we adopt a staggered appointment, you know. Appointments only coming in by scheduling” (H20)

- Daily patient quota

“Doctors were only limited to see 10 patients per day per doctor. It was more because we don't want the infection to spread that much that we don't want to congest the outpatient clinics, you don't want too many people inside the hospital or inside the OPD clinics.” (H14)

“Certain SOPs that we had to adopt, like limited numbers of patient coming to the clinic at one time.” (H20)

- Limit to number of accompanying friends/family members

“We had to limit only one relative next of kin to be there to accompany them. But, you know, sometimes it's not easy, especially when you want to discuss a very important discussion, like discussing about the cancer management.” (H20)

- Screening questionnaire and temperature checks prior to entry into premises

“All patients entering the hospital, must make a medical declaration at the gate. At the gate their body temperature would also be checked.” (H25)

- Brief history taking done outside of consult room to reduce contact time in an enclosed space

“Residents initially see the patient outside and if they think that this patient need a consultation, a consultant was there to provide dedicated care” (H13)

- Social distancing enforced

“For the clinical consultation, we were asked to maintain at least one metre distance away from the patient.” (H22)

### Table 4.3 – Summary of thematic findings on “Keeping Healthcare Workers Safe – Staff Wellbeing”

#### Staff safety surveillance

- Testing of staff
  - Post-COVID exposure
“If our infection control committee or infection control nurse would label them as high risk contact of a COVID positive patient, then they are mandated to undergo an RT-PCR five days after exposure and then required they are required to complete a 14 day quarantine.” (H14)

“In case of an emergency surgery must be performed on a patient suspected of infection by COVID-19. The patients and the surgery crew, the surgery team will be moved into quarantine after the surgery until a negative test result is available.” (H25)

- After each rotation of COVID duty
  - Seven days duty, seven days in a hotel for isolation, then they go for test. (H24)
  - All the personnel rotated from the field hospital must be put into a quarantine for two weeks to wait and take the SARS-COVID2 test. And only after two successive negative test would they be allowed to go back to work” (H25)

- At fixed intervals, depending on level of exposure risk
  - Basically, we have to do regular swabbing, all of us here, depending on exposure level” (H15)
  - There were two major surveillance tests conducted for our healthcare workers. This testing was performed for everyone, not only those who are going on duty in the COVID wards.” (H16)
    - Mandatory quarantine post exposure risk/COVID duty rotation
      - Seven days duty, seven days in a hotel for isolation, then they go for test. If they are negative they go home. Then stay seven days then come back again (H24)
      - We have had some cases where we suspect a staff member may be infected because they came into contact with probably COVID 19 positive cases, but each staff member were immediately moved to quarantine.” (H25)

- Provision of housing for staff on duty
  - Our COVID centre doctors, they do their duty for 12 hours, then they go to a hotel, not their home.” (H24)

- Contact tracing
  - For zone 1 staff risk, meaning whoever direct contact with the patient, we had to perform the contact tracing for them. (H20)

### Staff deployment

- Equity rule – rotation of staff for COVID duties
  - So we relocated the staffs in different groups and they came with the roster duties… we used a roster system so that everyone is not at risk all the time.” (H23)
  - As I mentioned, we were working on rotational basis. So directly and indirectly, they were involved in the care of COVID patients.” (H20)

- Protection of senior doctors or those with comorbidities
  - We avoided pregnant ladies from exposure. And we had a definitive plan of avoiding people with severe comorbidities or immunosuppression, getting exposed to suspected or positive COVID-19 patients” (H22)
  - Surgeons above 60 are not allowed to have contact with COVID positive patients. Those with comorbid conditions like heart disease, diabetes, kidney disease are not allowed to come to work” (H6)
Senior doctors operate to reduce operation time and exposure risk

“It was just felt that consultants and specialists could probably accomplish what was needed in a more efficient and minimal risk to the patients and also to other staff.” (H21)

“We were involved in management to reduce risk of contamination. Therefore even a simple case, I think it was done by a Senior Specialist rather than a junior most were involved.” (H20)
### Table 5 – Summary of thematic findings on “Response Strategies – Outreach to provide essential surgical care”

#### Telemedicine

**Functionality of telemedicine -**

- For general public enquiries
  
  “*We had volunteer physicians and even our interns who were not being required to report to the hospital they volunteered, they took in questions from all over the city and even the other parts of the country*” (H16)

- Remote triaging
  
  “*We have a triage system that is being managed by the Department of outpatient services. They are able to triage the patients that seek consult through the telemedicine website and send them over to that respective departments as necessary.*” (H16)

- Follow-up consultations
  
  “*They were basically waiting for the consultation and if we have not started their teleclinic that means that people would have started avoiding all those follow-up and basically... So just to avoid those things we started providing services for the teleclinic consult*” (H13)

- Consultations between doctors (community doctors to specialists)
  
  “*Sometimes some GPs call us from a different place in the country. They used (telemedicine) to take advice for their patients. So our specialists used (telemedicine) to give them advice over telephone.*” (H24)

#### Challenges in implementation –

- Lack of infrastructure
  
  “*We don’t have a facilities to start or run the telemedicine care in our hospital. Because to run those consultations, we will require a setup. We require some technical expert persons and software, and we don’t have those departments.*” (H23)

- Resistance to uptake
  
  “*However, most of the patients would like to see, to see their doctors are face to face. I think it’s because of the culture of the Filipino. They want to be seen and examined personally by their doctors.*” (H15)

- Legal and safety issues
  
  “*You need to understand PDPA and the whole process. Yeah, so there are quite a few legal issues that we need to sort out*” (H21)

- Widening of socioeconomic disparity in healthcare access
  
  “*Most of our patients are travelling from the remote areas, they are extremely poor and they don’t have enough access to the sort of modern technologies*” (H23)

  “*As I told you because 80% of the patient is from the subsidised. I think it is difficult for them. In a private patient. Yes, we can do we have a special wing in our hospital, in private yes.*” (H5)
### Social media and technology

- **Mobile phone applications**
  
  “We created this software of our own, Android phone. We started giving telemedicine services to the community. The community health worker will carry an android phone in their pocket will walk from one house to another house and ask them for any consultation if they need. They will be connected to the GNRC doctor. That's how we are trying to help them now.” (H8)

- **Social media platforms for information dissemination**
  
  “We had separate Facebook pages for all of our different specialties. These were usually, in the local vernacular, in Tagalog. And here, we would have instructions on how patients would be able to seek remote consult with us, through phone or even through Facebook, messenger and Viber.” (H16)

- **Media campaigns for public education**
  
  “Administration stepped up their public campaign saying that hospital is a safe place to visit, if somebody thinks that they should visit the hospital. At the same time, we were educating the public that to minimise the visits to the hospital unnecessarily.” (H22)