National Antarctic Programs’ operations during an unprecedented Antarctic season

Working through a global pandemic and the strength of COMNAP

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Summary

For the 2020/21 Antarctic season, a common goal focussed COMNAP Member national Antarctic programs: keep the coronavirus off the Antarctic continent, thereby keeping national Antarctic program expeditioners healthy and safe. In support of this goal:

* COMNAP established the COVID-19 *ad hoc* Subcommittee.
* COMNAP developed the “COVID-19 Outbreak Prevention and Management Guidelines”.
* COMNAP EXCOM increased their usual level of contact hours and met (online) regularly across the year to focus on COVID-19 relevant strategies to support the Membership.
* COMNAP Member and Observer national Antarctic programs increased their usual level of contact hours, and in addition to the AGM and Symposium, met (online) regularly in addition to any usual bilateral and multilateral meetings.
* All COMNAP Member national Antarctic programs implemented COVID-19 protocols.
* All but two COMNAP Member national Antarctic programs reduced their overall planned activity with overall Antarctic season activity reduced by an average of 58%.
* Long-term science, critical maintenance of buildings, infrastructure and equipment, including scientific equipment, was carried out successfully.

Purpose of this Information Paper

In a year of extraordinary challenges, national Antarctic programs recognised the increased risks presented to their operations during a global pandemic and proactively responded. This paper highlights the remarkable efforts by all COMNAP national Antarctic programs from December 2019 through to the present that enabled a challenging and successful Antarctic season to take place. The programs went to extreme measures to meet their obligations to deliver and support their countries’ Antarctic, and in some cases polar, research strategies, while focussing on keeping expeditioners healthy and safe. Information presented in this paper was gathered from a range of sources including from the COMNAP “Townhall Meetings” and from an informal survey of Members related to the 2020/21 Antarctic season.

Fundamental principles and common goals

National Antarctic programs all support one fundamental principle: Identify then mitigate or eliminate risk in order to keep Antarctic expeditioners safe.

Coupled with the fundamental safety principle, the purpose of each program can be broadly and generally described as to continually manage their Governments’ long-term investments in Antarctic infrastructure and research. Over the years, programs have developed various ways and means to do this and support efficient seasonal and year-round operations and logistics systems to/from their home countries to/from Antarctica. They have well-developed systems to support, equip and deliver their countries’ research strategy in the Antarctic. The global pandemic challenged these traditional ways and means.

For the 2020/21 Antarctic season, a common goal focussed COMNAP Member national Antarctic programs, that was, keep the coronavirus off the Antarctic continent, thereby keeping national Antarctic program expeditioners healthy and safe. By-and-large this goal was achieved and Antarctica remained the only COVID-19 free continent for a year from the time when, in December 2019, the World Health Organisation (WHO) was informed of cases of pneumonia of unknown cause in Wuhan City, China, and for nine months from March 2020, when the WHO announced that the COVID-19 outbreak was a global pandemic. At the time of writing, there are no reported cases of COVID-19 in Antarctica.

Prepare for an unprecedented Antarctic season

In early 2020, against the rapidly evolving global situation, the Antarctic season 2019/2020 was at peak activity. In March, as the WHO declared a global pandemic, many of the national Antarctic programs had successfully completed their summer season and were actively moving people, cargo and scientific samples north. Some were completing final tasks from the summer season and many had entered or were about to enter winter-over mode.

As the global situation began to worsen, some national Antarctic programs ended their 2019/20 Antarctic summer season earlier than planned, withdrawing personnel from Antarctica under urgency. As expeditioners were moving north to travel to their home countries, it became apparent that borders were closing, travel options were becoming limited and different countries had very differing levels of outbreak and response protocols. It took some expeditioners longer to travel home than the duration of their stay in Antarctica. At the close of all summer stations, the 975 winter-overs settled in on the only COVID-19 free continent.

On 9 March 2020, the COMNAP EXCOM met under urgency to “focus on devising a strategy that collectively strengthens national efforts to avoid introducing the coronavirus (COVID-19) disease to Antarctica.” EXCOM established the COMNAP COVID-19 *ad hoc* Subcommittee to advise COMNAP on matters of preparedness and response to the disease. Regular communications intensified amongst the Joint Expert Group on Human Biology & Medicine (JEGHBM). Through COMNAP, a single focus mobilised the national Antarctic programs: Keep the coronavirus off the Antarctic continent, thereby keeping national Antarctic program expeditioners healthy and safe.

On 18 March, the “COMNAP SARS‐CoV‐2 / COVID‐19 Recommendations (non‐mandatory) in the context of Antarctic Operations Working Paper” was sent to all programs. The document recognised that “Importantly the ability to respond to a highly infectious novel virus with significant mortality and morbidity in the extreme and austere environment of Antarctica with limited sophistication of medical care and public health responses is **High Risk** with potential catastrophic consequences including death.” There being no known cases of COVID-19 in Antarctica the key message was “Act Early and Act Strongly as containment and prevention must be the priority to prevent introduction of SARS‐CoV‐19 in Antarctica.”

The Working Paper recommended that “...all national Antarctic programs who have not already closed their seasonal facilities or who have not yet entered TOTAL winter‐over/winter isolation mode, should urgently reconsider any scheduled access, personnel and freight transport into Antarctica...” and also that “Tourists should be prevented from entering national Antarctic program facilities and from any interaction with national Antarctic program personnel. Tourists MUST be prevented from visiting research stations”. Regular communications between the COMNAP and IAATO Secretariats was established, maintained and proved fruitful.

Later, it became known, that nearly 60% of 217 people on-board the tourist vessel *Greg Mortimer* tested positive for coronavirus upon arrival in Uruguay after activity in the Antarctic Peninsula region between 18–22 March 2020. That vessel had no plans in their schedule to visit any occupied stations while in Antarctica.

By 29 June 2020, “The COMNAP COVID-19 Outbreak Prevention & Management Guidelines” were developed and were distributed to Member and Observer national Antarctic programs and shared with IAATO. The Guidelines are a demonstration of consensus commitment to the common goal. They continue to be regularly reviewed and updated. Renewed guidelines in anticipation of Antarctic season 2021/22 are currently under development.

Member national Antarctic programs relied upon the relationships, communications chain and network that COMNAP has provided for over 30 years. Through COMNAP, advice based on WHO technical guidance was quickly developed and shared. The advice was strengthen by Member programs freely contributing their relevant expertise and lessons learned. More than ever, the COMNAP Membership supported each other with instrumental leadership from the COMNAP Secretariat and the EXCOM.

As the year progressed there was hope that the global pandemic would end sooner rather than later. National Antarctic programs were planning for “normal” operations but were also making contingency plans. Soon, it became clear that the pandemic was not lessening and vaccination was some time off.

Recognising that if Antarctic season 2020/21 was to take place, and if the fundamental principle of keeping expeditioners safe was to be met, programs had to implement strict protocols and reduce all planned activity. Again, the COMNAP network proved critical in this regard with regular online meetings organised through the Secretariat which were well-attended and provided platforms to share information on protocols and the status at each gateway. Through the COVID-19 *ad hoc* Subcommittee and the JEGHBM, national Antarctic program medical directors continuously shared their COVID-19 response plans and resources and supported each other.

All programs implemented COVID-19 protocols for their deploying expeditioners and all but two programs reduced their overall planned activity.

Develop and implement strict protocols: Medical

The COMNAP Guidelines recommended that in addition to the usual pre-deployment medical screening of expeditioners, “medical doctors carry out a notes screening and physical screening for Antarctic deploying personnel that gives consideration to, the risk factors for COVID‐19”. This additional screening was a ‘first line of defence’. Those expeditioners that failed the pre-deployment medical screening were replaced and many national Antarctic programs built redundancy into their hiring process for this reason and also in the case where an expeditioner did pass the medical but was stopped in transit to Antarctica for testing positive for COVID-19. National Antarctic programs built support into their programs in case of this eventuality.

In preparedness for the season, all national Antarctic programs were urged to review and enhance their healthcare staffing levels, training and remote medical support requirements, diagnostic capability, infection control and isolation capability, any ICU capability including prolonged capabilities (oxygen supplies) and their medevac plans. Many of the national Antarctic programs acquired and shipped Polymerase Chain Reaction (PCR) testing kits and equipment to Antarctic facilities or outfitted their vessels with testing capabilities, along with additional Personal Protection Equipment (PPE) supplies. Information in regards to any special medical capabilities/equipment availability was shared during the COMNAP AGM Regional Break-out Groups sessions, in advance of the start of the season. An update of this information share will take place during the COMNAP AGM 2021 (July).

Develop and implement strict protocols: Pre-departure quarantine/isolation and testing

The COMNAP Guidelines called for “Managed isolation...for all expeditioners for at least a minimum of 14 days as part of the pre-deployment process.” The guidelines urged for testing coupled with the isolation protocols and recommended “No one with a positive pre‐deployment COVID‐19 test result to be deployed...” to Antarctica.

All programs implemented COVID-19 protocols for their deploying expeditioners. In some cases, these were on top of any protocols established for international travellers arriving at the Antarctic gateway. In other cases, national Antarctic programs utilised long-haul transport options such as vessels or charter aircraft so that there was no transiting during deployment, meaning isolation remained in place for the duration of the journey to/from Antarctic to/from the home nation.

Implementation of the protocols required significant additional funding for the majority of the programs. Informal survey results suggest the extra costs ranged from $USD10,000 to $USD3.5M. On average, the extra funding was $USD425,000 per program.

Reduce activity while maintaining critical long-term investments: Infrastructure including scientific equipment

While some Antarctic infrastructure, including scientific equipment, can spend long periods of time autonomously in the extreme environments of Antarctica, all require regular maintenance and assurances related to power supply. Normal Antarctic conditions and also extreme weather events, including high winds and storms, can lead to damage or downtime of instrumentation which, if left undiscovered, can jeopardise science projects and interrupt long-term datasets. Therefore, Government investment in Antarctic infrastructure relies on national Antarctic program personnel expertise and on regular maintenance. Antarctic summer seasons are the optimum time to complete regular maintenance of infrastructures and to confirm reliability of scientific equipment, deploy new scientific instrumentation and retrieve collected and stored winter-over data when real-time data transfer is not available. So any decision to reduce activity and personnel going south had to be coupled with consideration as to how required maintenance and science support would be completed. Antarctic buildings require regular inspection, care and maintenance to endure Antarctic conditions. Missing regular maintenance can be catastrophic for some infrastructure and a single missed season risks loss of investment and entire research programs over multiple years.

All but two of the 30 COMNAP Member national Antarctic programs decided to reduce overall Antarctic activity for the summer season 2020/21. Four of the programs had no activity at all-meaning they did not send expeditioners to the Antarctic for the season and kept their key infrastructures closed. Large construction and infrastructure maintenance projects were postponed and programs reviewed essential activity requirements, focusing on those.

Informal survey results showed:

* Overall activity for the 2020/21 Antarctic summer season was down/reduced by 58% on average across all programs (range from 20% less to 85% less).
* There was 60% less logistics activity (range from 15% less to 90% less and in some cases 100% less in either air or sea logistics than what would be normal/usual).
* There was 66% less scientific activity with less scientists deployed than would be usual/normal (range from 10% less to 100% less, that is, no scientists deployed).
* There were an average of 68% less people deployed than would be normal for an Antarctic summer season.

Inter-continental flights were significantly reduced and many programs relied on their vessels to directly deliver their expeditioners and supplies to/from Antarctica. Intra-continental movement was also significantly reduced from normal seasonal activity and visits between stations discouraged. The IAATO Secretariat supported the Guideline’s recommendation for no tourist visitations to stations.

International collaboration continues

Informal survey results indicated there was less on-ice international collaboration due to implementation of COVID-19 protocols, but international collaboration remained high outside of Antarctica and in particular due to COVID-19 national procedures and protocols, and assisting each other to navigate and understand those national protocols and transiting procedures. Within COMNAP, there is usually opportunity for “informal” or “opportunistic” international collaboration or support in some manner or another. The reduction in logistics and the challenges presented by the need to isolate and not interact freely meant that most informal or opportunistic requests for international support could not be met this season. This resulted in lost or delayed opportunities that would have taken place in any other “normal" season.

Even with isolation protocols in place, there was some international collaboration which did take place. This was in the form of transportation of programs cargo to/from Antarctica on-board another program’s vessel or aircraft-most of this cargo now being stored for work next season. Other examples included international response during medevacs, transportation of passengers on alternative carrier when planned vessel voyage cancelled, recovery of scientific instrumentation and data retrieval from Antarctica, one program used (after consultation) food and supplies (already in Antarctica) from another national program’s cache, and sharing of weather forecasting just to name a few examples.

Search and Rescue (SAR) coordination and response relationships continued throughout with recognition that emergency response requirements might still be needed across the range of Antarctic activity (national Antarctic programs, NGO activity including tourism and fisheries, etc.) even given the reduced level. The COMNAP Asset Tracking System (CATS) and the Antarctic Flight Information Manual (AFIM) became heavily replied upon tools to understand big picture activity and duration of seasonal activity.

Antarctic science continues

All national Antarctic programs recognise the importance of their Antarctic research, especially the continuance of long-term data collection and multi-season projects, and endeavoured to prioritise support of that science during a reduced activity season. There was robust discussion with the research community. There is also awareness that the reduction in personnel going to the Antarctic most likely had the greatest impact on our early career researchers. All national Antarctic programs are being encouraged to work with their research communities to ensure support for early career persons that might need access to available Antarctic data/samples in archives and databases.

With informal survey results indicating there was a 66% reduction in science in the Antarctic that means that 34% of the planned science was supported. The results also indicated that most national Antarctic programs are confident that their winter-over season will be “normal”, that is, with the usual number of personnel on station carrying out “more than last season” up to the “usual level of science” for that station/programs. So a return to “normal” operations with 100% winter-over science support over the current winter-over period 2021/22.

It remains to be seen how program budgets and research funding might be impacted for upcoming seasons. Already some programs are seeing less research proposal submissions due to a range of COVID-19 impacts.

Closing remarks

The 2020/21 Antarctic summer season was remarkable and the national Antarctic programs stepped up to the added challenge presented by operations during a global pandemic. The informal survey of COMNAP Member programs, taken after the end of the 2020/21 Antarctic summer season, reported that a majority of the respondents considered the season difficult but successful under the circumstances. This success is largely due to the expertise and resilience of the people in the national Antarctic programs who work together within COMNAP in the spirit of cooperation that is the foundation of the Antarctic Treaty System.

Planning has already begun for the start of Antarctic season 2021/22. Presently, the global pandemic continues, there are 219 countries with 143,532,000 total cases confirmed and over 3 million deaths. There are several vaccines available, currently 2.7% of the global population being fully vaccinated. There are at least five variants of concern, each with known attributes including increased transmissibility, and uncertainties related to vaccination efficacy. The JEGHBM has prepared a vaccine advisory paper and COMNAP Guidelines are being reviewed and revised.

It appears that the 2021/22 season will also be especially challenging due to the SARS-CoV-2 virus.