

# COVID-19 and General Practice, Insights Paper no.2 – A predictive impact model for the healthcare sector.

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Central and Eastern Sydney Primary Health Network  
South Western Sydney Primary Health Network  
Gippsland Primary Health Network  
Eastern Melbourne Primary Health Network  
South Eastern Melbourne Primary Health Network

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## Preamble

Through the COVID-19 outbreak, Outcome Health has been producing daily reports and dashboards via the POLARGP tool for Primary Health Networks (PHNs) to allow direct planning and resource allocation through their respective practices. These reports are an initiative of the following PHNs – Central and Eastern Sydney, South Western Sydney, Gippsland, Eastern Melbourne and South Eastern Melbourne.

More information about POLAR GP can be found here [polargp.org.au](http://polargp.org.au).

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## Key learnings

- General practice has borne the burden of patient care in the early days of the pandemic and has not had the time to plan and prepare, unlike the secondary care sector.
- The time taken away from ‘business as usual’ to address the current pandemic in general practice will have inevitable consequences for both the primary and acute health care sectors.
- The nature of general practice consultations has changed.
- General practice data can operate as the ‘canary in the coal mine’ signalling the likely impact both within the primary and acute sectors. Its early access to quality data can help to predict future impacts.
- Chronic disease exacerbations are likely to escalate in prevalence because people are currently not receiving their usual preventive care and treatment.
- Mental health is likely to become the biggest issue in the health sector, given the combination of anxiety, isolation, and bushfire trauma.

## Recommendations

- Urgent work needs to be done to understand and address the implications of the increase in telehealth and e-prescribing on General Practices as many processes still reflect a paper-based approach.
- General Practice needs to develop means of continuing chronic disease care in the current environment.
- E-prescribing is welcomed, but there is urgent need for the rest of the care pathways (referrals, test ordering) to be made electronic.
- Interoperability is key to success and EMR and other critical software need to be engaged and supported to develop a common strategy to structure their products to support a fully digital service.

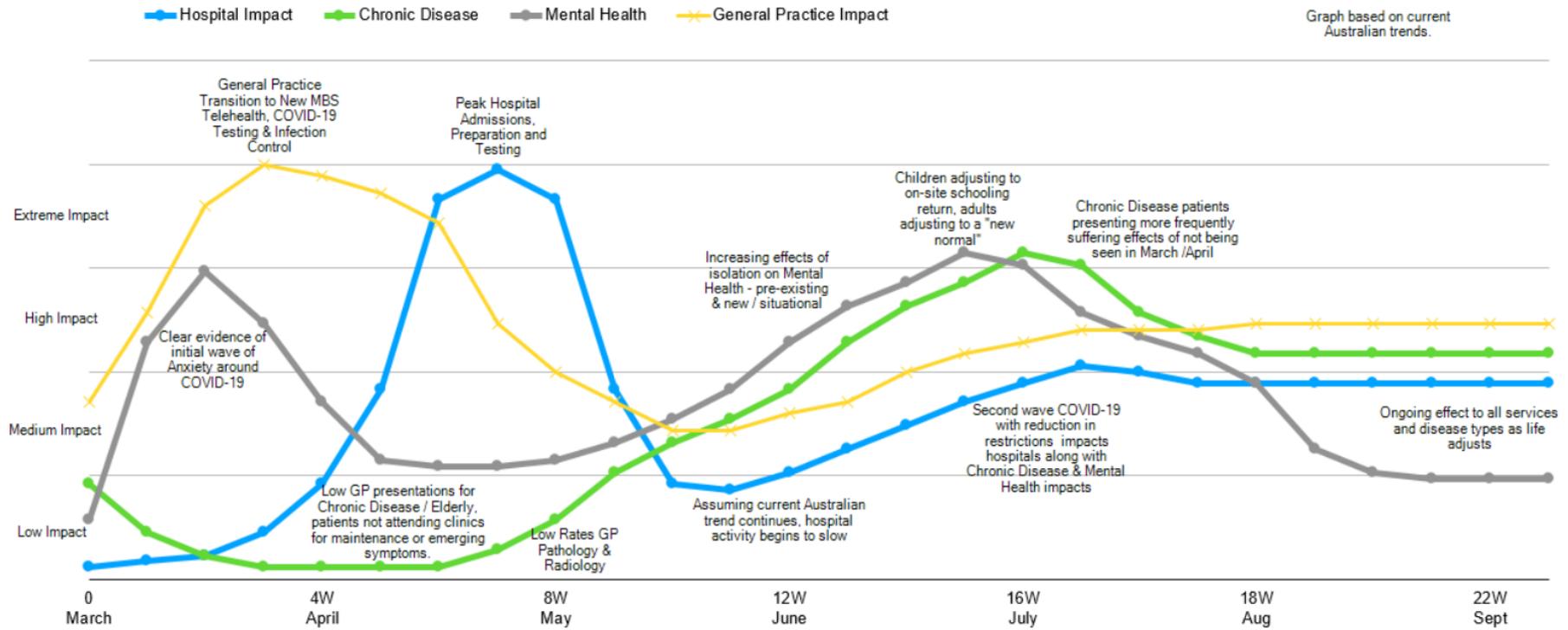


Figure 1: POLAR Predictive Impact Model

## Model summary

This model makes predictions about health service need and usage for the next five months based on

- the current infection rates and trajectories, and
- the first 6-7 weeks of the pandemic impact on the Australian Healthcare system.

This model is **not** an attempt to map outbreaks or numbers of cases based on a range of scenarios. Rather, it uses PHN data and publicly available COVID-19 state and federal databases and is designed to inform both policy development and service planning.

Since mid-March POLAR has summarised the information from 1000 general practices across NSW and Victoria, following GP activity and patient trends in response to the most challenging health event of the last 100 years. This model is based on that data, we have no reason to believe that practices outside the POLAR network will be any different, recognising that the remote context is limited to the Gippsland region.

The time course can be divided into three phases.

1. **The Time of Uncertainty:** *late February to March*. This is the time before the virus has had significant impact – it was the time of preparation, but also uncertainty, as governments grapple with policies such as the degree of social distancing.
2. **The Time of Spread:** *Late March to April*. The virus is having an impact, and the case numbers are rising. This is where we are at now. The peak of the curve hopefully flattened.
3. **The Time of Consequences:** In the period after the curve, we will see what the long term impacts of the virus are. Not just clinical, but social. We do not yet have any rigorous data on what post-COVID infection syndrome looks like, nor on the consequences to care of those with non -COVID disease, including the associated impacts on regular models of care.

## Model predictions

The model (figure 1) uses four parameters to represent the overall impact of COVID 19 on the health sector – General Practice, Hospital, Chronic Disease and Mental Health. The burden of disease from COVID-19 will fall on General Practice and remain consistently high throughout the model period, unlike the three parameters which dip at some point into ‘Low Impact’. The changes seen in chronic disease and mental health will lead to increased demand both in General Practice and the hospital sector during the Time of Consequences

### Analysis

General Practice saw a steep increase from medium to extreme level during the Time of Uncertainty, and this was maintained during the Time of Spread. The Time of Consequences - early phase will see the impact decline to medium. However, the model predicts a gradual increase to high impact and then maintenance during the late phase.

The Time of Uncertainty had little impact on the hospital sector. It increased steeply to have a high impact during the Time of Spread and will decrease equally quickly to low impact during the Time of Consequences – Early Phase. However, the model predicts a gradual increase to moderate impact and then maintenance during the late phase. Chronic disease began at its usual low-medium level and decreased during the Time of Uncertainty to a very low level, which it then maintained during the Time of Spread. However, during the Time of Consequences - early phase it is predicted to steadily increase to medium-high level.

Mental health began at a low level and increased sharply to have high impact during the Time of Uncertainty. The Time of Spread has seen a gradual decline to low-medium levels. The model predicts that it will remain at the medium level during the Time of Consequences - early phase. It also predicts another peak during the Time of Consequences – late phase before dropping back to low-medium level.

The impact on General Practice remains consistently high throughout the model period, unlike the three parameters which dip at some point into ‘Low Impact’. The changes seen in chronic disease and mental health will lead to increased demand both in General Practice and the hospital sector during the Time of Consequences.

## Model in detail

### 1. General practice impact

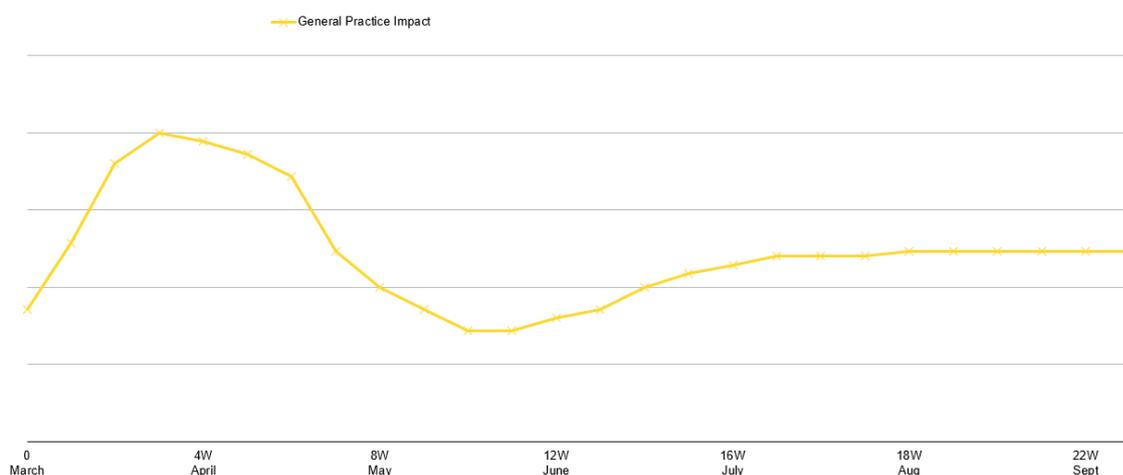


Figure 2. General Practice Impact

Analysis

There is clear evidence that general practice bore the brunt of the initial impact of COVID-19 during the Time of Uncertainty. Data indicate there was a rush to see general practitioners at a time when infection control, staffing and changes to funding were fundamentally altering the way General Practice operates. Practices were also grappling with multiple issues such as: ensuring adequate Personal Protective Equipment (PPE) supplies; reconfiguring practice infrastructure for ‘no contact’ scenarios; managing high levels of occupational violence, responding to reduced financial viability and ensuring business continuity. With private billing significantly reduced and activities like influenza vaccinations making up a significant amount of general practice activity (up to 25%) on a cost recovery fee for service basis the ongoing viability of general practice is being significantly challenged.

Further complicating the matter was the widespread introduction of MBS items for telehealth. General practice had long campaigned for Telehealth funding. It is usual business for general practitioners to make phone calls to patients and families. As this has not been funded previously, we have no baseline with which to measure the change though clearly this has increased. Unfortunately, the new item numbers were necessarily introduced with little warning or the required preparation. It is important to bear in mind that general practice is, in effect, a series of small businesses, and is not provided the same level of government support and co-ordination as hospitals which are oversighted by jurisdictions. For this reason and others, the work of general practice and PHNs is not as widely recognised by government nor the wider community.

The type of patients presenting to general practice and the care they are being provided changed significantly during the Time of Uncertainty. For instance, prescription rates increased for those with chronic disease, suggesting that some people accessed and stored medications in case of future shortage or difficulties with access. After the initial surge in attendance we have seen a significant drop off in attendances for chronic and preventive care consultations<sup>1</sup>. As an example, Figure 3 shows the drop off in the new cervical screening program (Note, the overall numbers are partially lower due to the switch to the new program with less frequent testing)

Cervical Screening Comparison by Week of Year

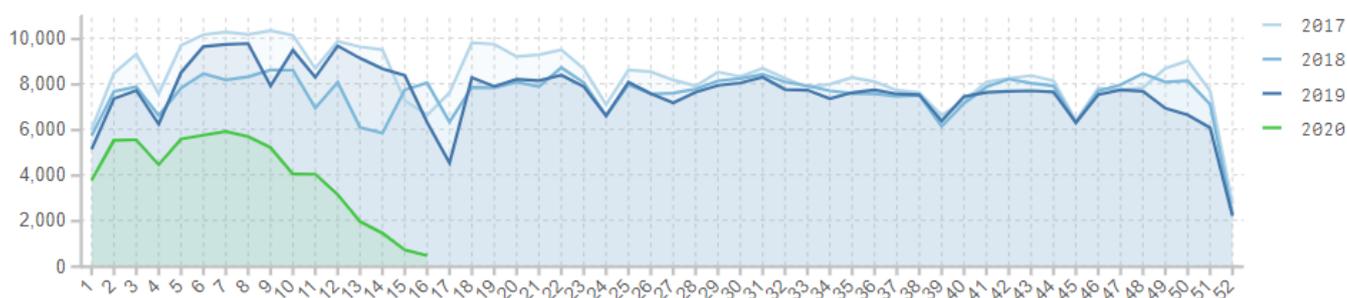


Figure 3 – Cervical screening

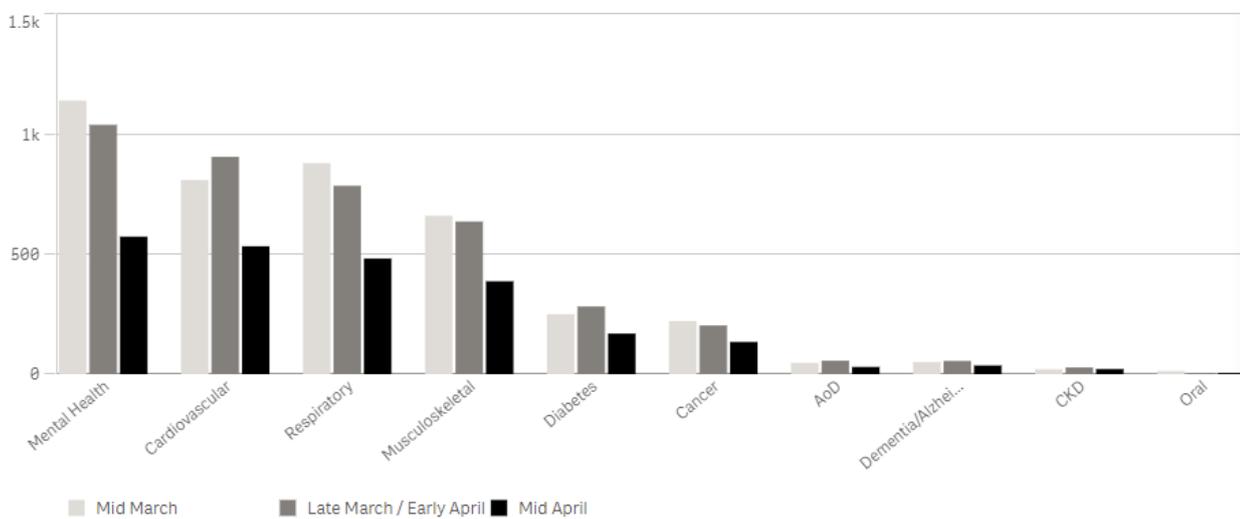
Discussion

<sup>1</sup> A note on the data: Outcome has developed a practical grouping of diagnoses into chronic disease and mental health groups. These are based on a combination of SNOMED codes and time of diagnoses in the EMR. Reference available on request.

General practices, supported by their PHNs, have shown an amazing capacity to transform their care model within a two to three-week time frame to deliver safe, appropriate care that protects patients and their own practice staff needing to make proactive and agile decisions. These changes will have long lasting impact for patients and practitioners alike. However, there have been significant challenges: the type of patients presenting to general practice and the care they are being provided has changed significantly. After the initial surge in attendance – during the *Time of Uncertainty* - we have seen a significant drop off in attendances for chronic and preventive care consultations.

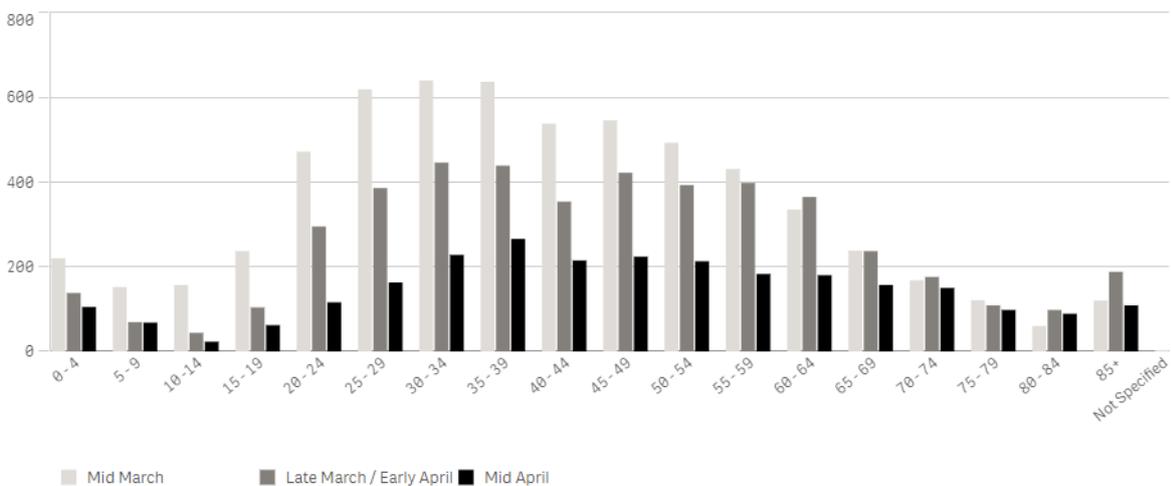
The following figure presents the numbers of consultations by chronic disease groups over the early periods (Uncertainty and Spread). In addition to reaching out to general practice we are aware that telephone support services are seeing increasing utilisation and there are early reports of increased self-harm and suicide.

**COVID Chronic Disease Population change over time**



**Figure 4. Chronic Disease breakdown over time by COVID related presentations, (COVID related pathology or COVID diagnosis).**

**COVID Patient population age change over time**



**Figure 5. Age breakdown by COVID related presentations, (COVID related pathology or COVID diagnosis).**

Patient population age change over time (Two Week Profiling)

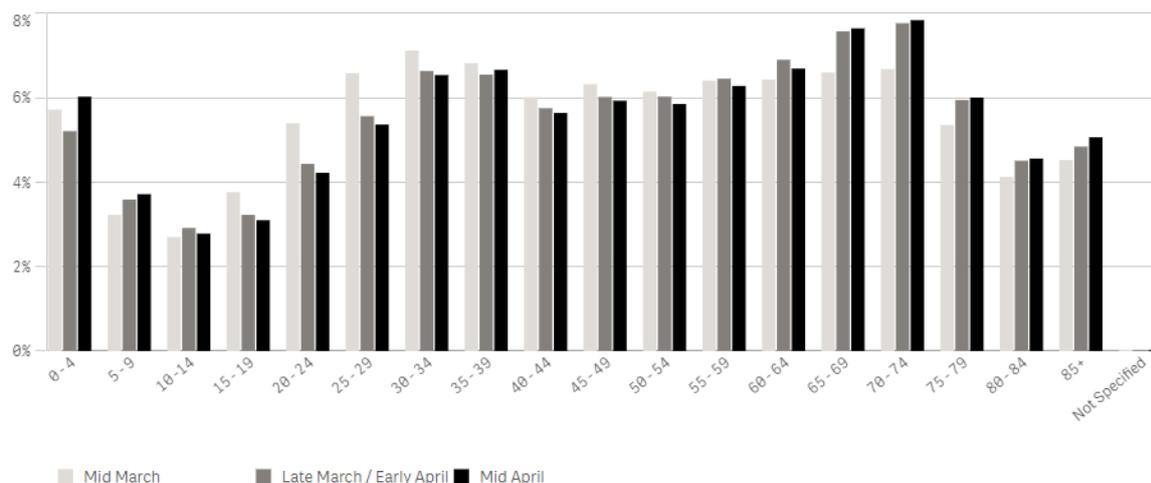


Figure 6. All patient presentations over time Mid March → Mid April

It is not just chronic care either – figure 7 shows a distinct drop-off in referrals made to specialists in the Time of Spread. In summary, whilst the overall contact rate in general practice has remained largely unchanged, the nature of those contacts has changed fundamentally – with reductions in common areas such as preventive health, chronic disease care and even ongoing referrals.

Victorian PHNs undertook a simple survey of 300 GPs from around Victoria in mid-April 2020 to try to better understand the change in pathology and diagnostic imaging ordering.

What we learnt was that approximately 40% of GPs surveyed believe that secondary and tertiary care does not have the capacity to see their patients. Given a significant amount of test ordering is done to prepare people for specialist consultations, elective surgery and other procedural care, some of this referral drop can be understood in part as GPs pausing what is now no longer time sensitive testing. We would expect that as hospital services recommencing testing will also increase proportionally.

Some pathology and diagnostic imaging requests occur as a part of routine health care maintenance, such as pap smears and routine cancer screening for low risk patients, A large percent of general practices have stood up a medical triaging service within their practices, utilising the new MBS item numbers to speak to patients and triage their health needs. In many cases routine testing is being postponed while general practices have been inundated with people who are anxious (mental health issues are present in almost every consultation to some degree) and/or the need to be assessed for potential COVID 19 screening. Flu vaccination activity is also up 88% on this time last year. Where practices have a supply of vaccine they are prioritising this work, especially in their at risk patient populations. Routine care will no doubt be pick up again in the coming weeks and we should be able to see this reflected in the data.

Additionally, issues of access for patients are significant here with many anecdotal stories of patients refusing need blood tests and other requests. In our survey GPs reported that up to 20% of patients were refusing to leave home, while another 25% did not have any transport to get to a collection site. Patients and their families will put mechanisms in place to support each other over the coming

weeks, and we would expect this situation to improve, particularly as the community is more confident to leave home.

Referrals Comparison by Week of Year

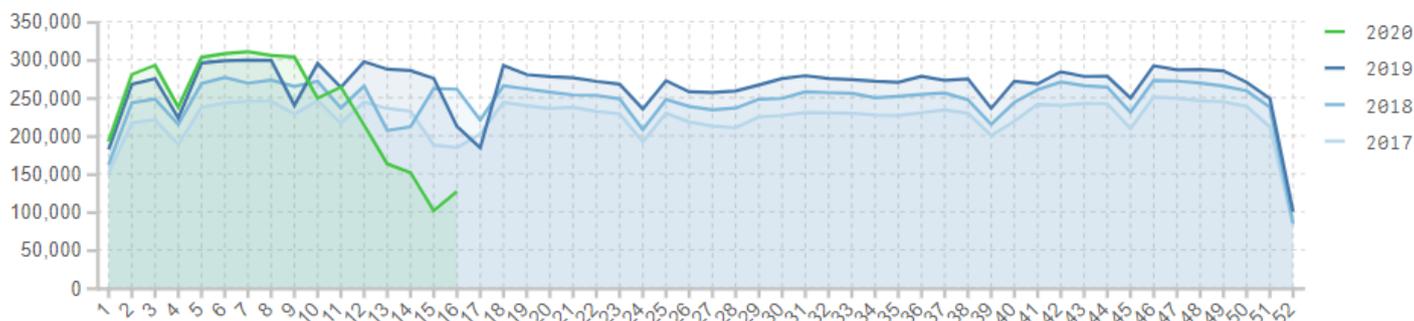


FIGURE 7: Specialist referrals comparison

Consultation rates will likely be sustained in the coming weeks as practices commence mass influenza vaccinations but may drop off after that. Further, while each of the other lines on the model at some point dips into ‘Low Impact’, General Practice consistently remains high throughout the model period. The burden of disease from the COVID period will fall on primary care, just at the time when it itself is transforming care delivery. Secondary care has had time to plan, primary care is trying to do two things at once.

Since the end of March, the majority of consultations have now moved to telephone or telehealth. Telehealth has previously only been funded from an MBS perspective in very remote communities, for some after-hours services and for specific disease related activity. The change to a new way of working and frequent changes to the MBS schedule during March, while welcomed, created both opportunities and obstacles for General Practice from a business, patient flow and ‘everyday care’ perspective. Telephone has become the majority technology due to its familiarity, despite the benefits of video. Telephone consultations are being used innovatively for a range of different purposes including triage, care planning, case conferencing with families, counselling and more. Given the move to telephone rather than a digitised workflow there have been flow on effects to work practices that such as pathology and radiology ordering, that still have largely paper based workflows.

The arrival of e-prescribing is welcomed. But this highlights a further issue for GPs – that the electronic medical record (EMR) systems are poorly designed for the current way of working. Still reflecting a world where interaction with the external world is largely via paper, there are issues all along the chain from:

- Billing software,
- Recording of teleconsultations,
- Lack of significant electronic information transfer,
- Apps designed for social media are inadequate for patient-doctor interaction,
- Videoconferencing software designed for office meetings is poorly suited to health consultations.
- Difficulties working off site,
- Environments that finds GPs sending photographs via their own mobile phones,

- Dedicated portals for telehealth are not widely adopted, yet to be integrated into workflows and may come with a cost,
- There are existing digital platforms such as the Australian Immunisation Register and My Health Record that could be supporting clinical care which require further investment by consumers and clinicians alike.

Liability issues are being created when patients use these apps for messaging their general practice 24 hours a day, 7 days a week, expecting an immediate answer. This new way of working is at pace creating questions and resolving issues. There is more work here to support all involved in working in this new environment, with a particular focus on high quality and safe practice.

## 2. Hospital impact

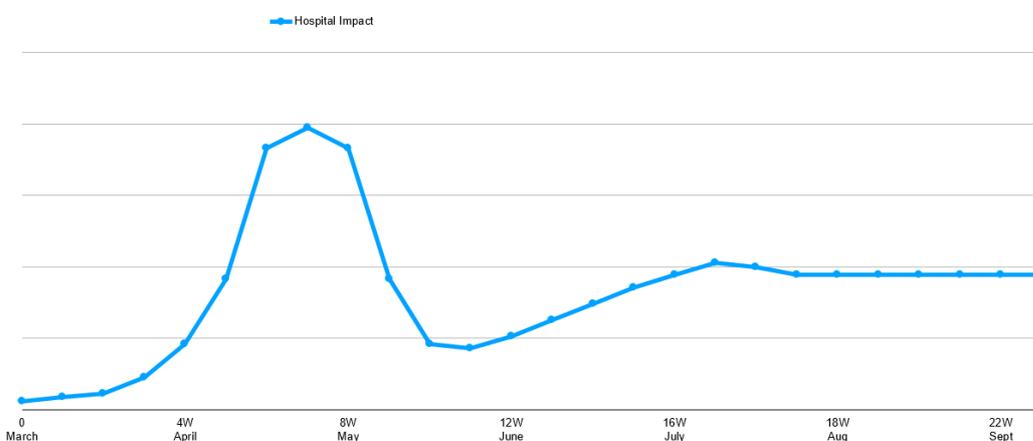


Figure 8. Hospital Impact

### Analysis

At the time of this report, the impact on the hospital system from an inpatient case load perspective has been relatively low, taking the sector as a whole, although the impact has been greater in NSW. However, the model predicts a ‘catchup’ period during August-September will keep hospitals in the Medium to High impact zones likely until at least Christmas.

### Discussion

We have not seen overflowing ICUs, emergency hospitals in convention centres – all of which have been seen overseas. Most hospital activity has focused on preparation, infection control and COVID-19 testing in EDs or special ‘fever clinics’. Not counted in these considerations is the impact of those ‘fever clinics’ – with many not establishing a system of communication back to the community GP. Cancelling elective surgery has freed up hospital space, but there has been a general reduction in presentations of Non COVID-19 conditions. People are largely staying away from hospitals at present; this appears to be a response to public health messages around hospitals potentially being inundated and fear of possible infection at a hospital site. Citizens also believe that they are heeding the Prime

Ministers call to stay at home by putting their health at risk as the general population interpret these messages. The model assumes that this will rebound at some stage.

Based on current figures, throughout May we would expect a decrease in COVID related ICU and general presentations. Much of the preparatory work will have been completed and with little elective surgery underway and relatively low emergency presentations we predict a low period for hospitals during May. This will not continue, with the Chronic Disease group that has not attended primary care for preventive activities now at more risk of hospital admission, a steady increase in Mental Health and psychosocial care related admissions and possible future waves of COVID related presentations.

### 3. Chronic Disease Impact

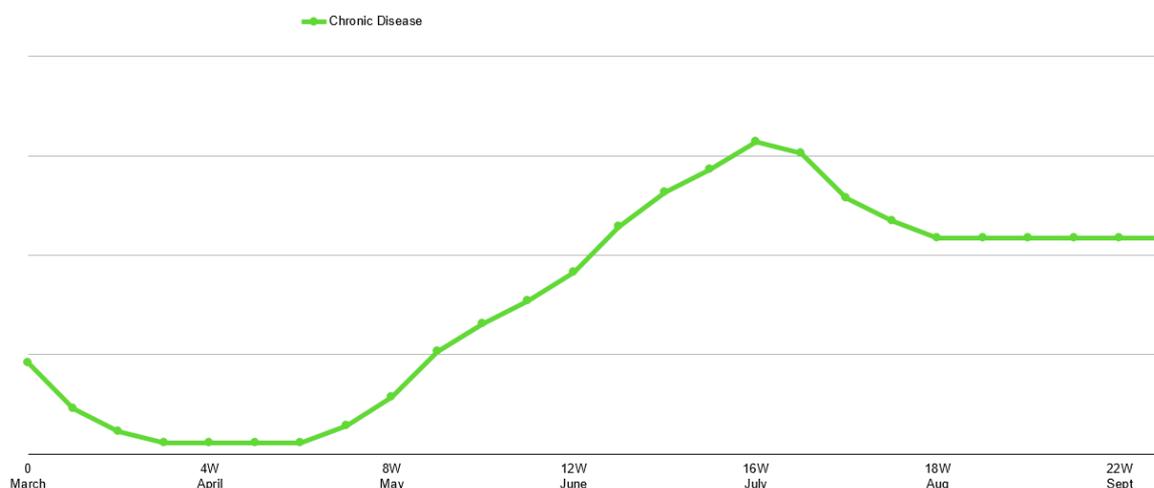


Figure 9. – the impact of the Pandemic on chronic disease care

#### Analysis

The chronic disease line starts at a relatively low baseline, representing the usual level of fairly constant activity in General Practice, and it drops away during the Time of Uncertainty and the Time of Spread. However, the model predicts that the impact of the pandemic on Chronic Disease will not peak until well into the Time of Consequences. It will fall, but not to its baseline, remaining at a much higher level than before the pandemic.

#### Discussion

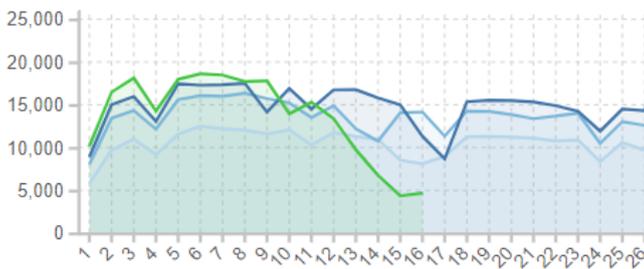
General practice data shows significant numbers of Chronic Disease patients are not interacting with their practices and not having the regular pathology and radiology testing that goes with the proper management of their conditions. There are also adverse effects of physical distancing such as lower levels of exercise, dietary changes and low levels of social interaction. These are all well known risk factors for deteriorating health. At the same time, it is likely that patients are not presenting to General Practice with relatively minor problems associated with Chronic Disease and will present later

as a larger problem to General Practice or to Emergency Departments. Figure 10 shows the comparative drop-offs in testing for diabetes care (HbA1C) and care plans overall. Similar falls are seen for all aspects of health assessments, care plan reviews, etc.

Armed with evidence about the impact of COVID19 on particular co-morbidities, primary health care is in a position to proactively and systematically work with patients and their families to ensure that each person is provided with management advice that will optimise their health and wellbeing during this time. This will mean new (digital) ways of working with specialist and hospital colleagues to design and implement new shared care models of care. Telemonitoring, digital health coaching and other applications could reduce the medium to long term effects on the pandemic as predicted in the model. PHNs are well positioned with additional resourcing to facilitate this way forward with general practice given their existing expertise and relationships at the local level.

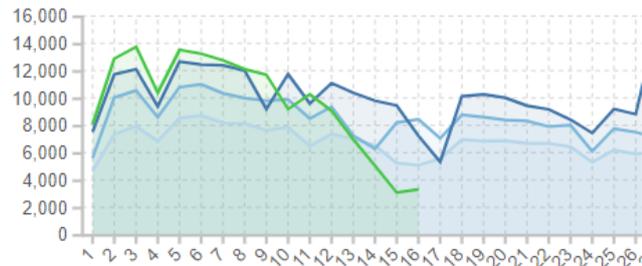
**Care Plans Comparison by Week of Year**

Item Numbers 721 & 723



**Care Plan Reviews Comparison by Week of Year**

Item Number 732



**HbA1C tests as a % of all pathology 2020 vs 2019**

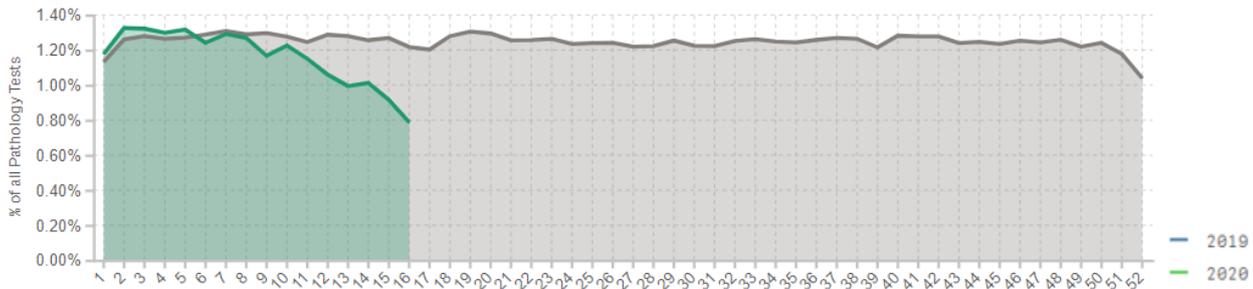
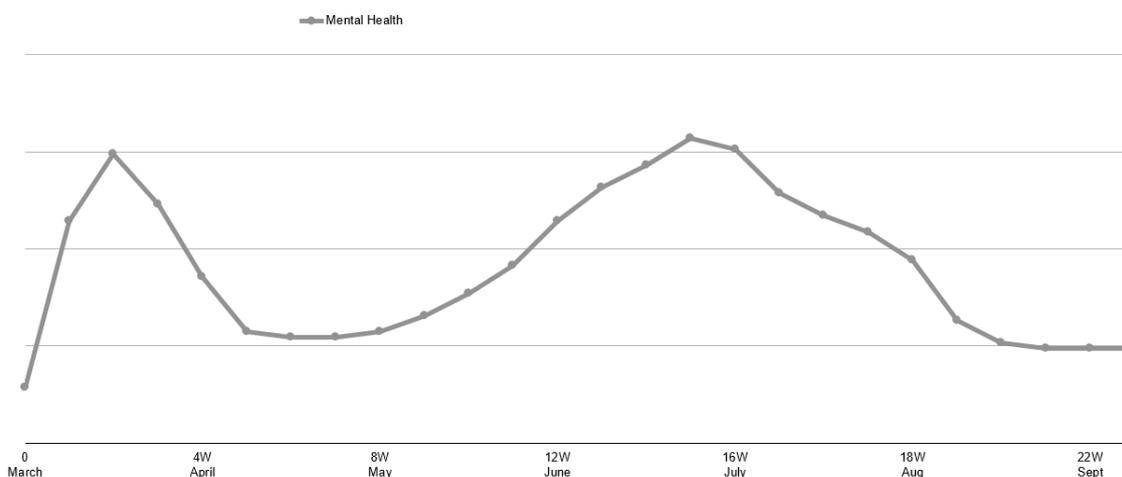


Figure 10 – The Impacts of the pandemic on designated preventive health activities

## 4. Mental health impact



**Figure 11. The Impact of the Pandemic on Mental Health**

### Analysis

The POLAR data shows an initial wave of anxiety diagnoses presented to General Practice across March – during the Time of Uncertainty. Anxiety is a normal response to a pandemic situation, and we have begun to see some reduction in presentations for mental health within the Time of Spread. However, the model predicts a new rise in mental health presentations to both hospitals and general practice, steadily rising through June, peaking in July and then levelling at medium to high impact from August onwards when it is likely some of the social distancing measures will be rolled back.

Some reduction in presentations for mental health issues has begun to be seen within the data in April. However, we predict a new rise in Mental Health presentations to both acute and primary care environments, steadily rising through June, peaking in July where it is likely some social distancing measures may be cut back.

### Discussion

From Mid-April to May - June, depending on the state, school age children will be schooled remotely. Adjustments and difficulty related to this social change, in addition to the ongoing impact of isolation, are likely to escalate through May-June. In July we will likely see a move back to a regular school routine; and we predict we will see adjustment reactions and an increase in school refusal from vulnerable young people at this time.

The reduced face to face contact with health practitioners is likely to have further increased use of telephone help lines, mental health apps, and self-help amongst consumers and families. PHN assessment and referral lines have already seen an increase in consumer-mediated contacts and this may also be seen in allied health where a medical referral is not required. So while service utilisation

may have dropped those with high health literacy and/or digital literacy will find means to gain access to services. Community members with lower health and/or digital literacy are likely to be further disadvantaged in the current situation.

By June-July most people will have been self-isolating for two to three months. Some people, particularly those who live alone or in unsafe environments, will be feeling significant emotional affects. People with no history of mental illness may begin to experience a deterioration in their mental health and those with pre-existing conditions may begin to express further symptoms. General Practice and the hospital sector will be facing more than usual Mental Health presentations.

During August-September we would expect some relaxation in physical distancing measures leading to an overall improvement in mental health. Children are likely to be back at school and have had time to adjust to a return to that routine. However, we will also see the impact of seasonal factors, the end of Winter, start of Spring may also come into play.

While the majority of the NSW and Victorian east coast were affected in some way by bushfire, some areas such as Gippsland were particularly hard hit. The social and mental health effect of this ‘double hit’, or cumulative impact, should also be taken into consideration. In these areas we would expect to see a heightened and longer term trend for poor mental health.

## 5. Initial impacts, March – May

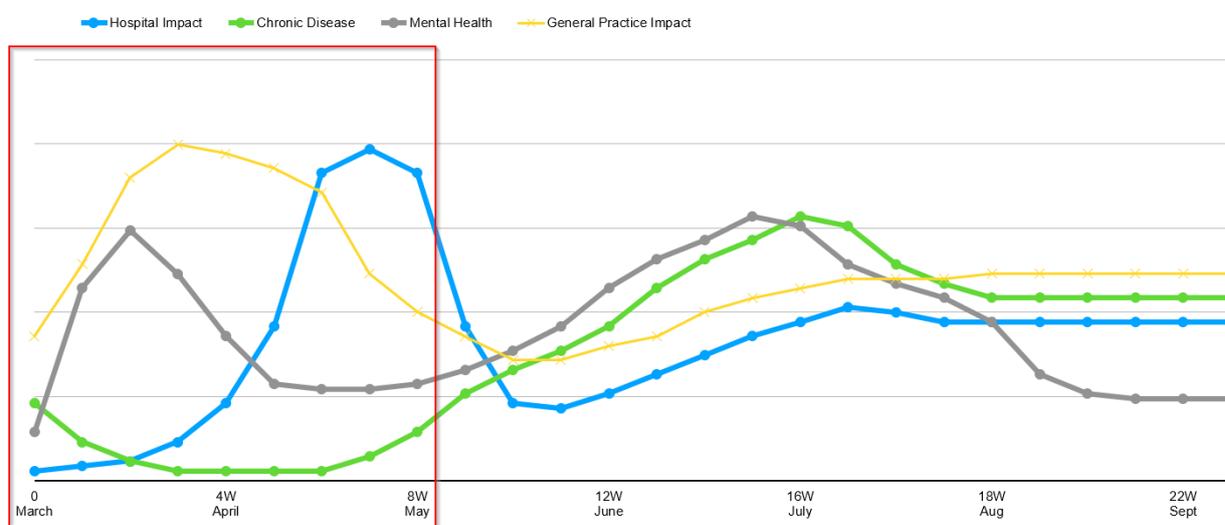


Figure 12. Early Impacts

### Health service impacts

The March to early May period (Times of Uncertainty and Spread) had significant effects on both the primary and tertiary health care sectors. As discussed, General Practice bore the initial brunt of COVID, while the hospital system focused on preparation, testing and some treatment.

Additionally, there has been significant changes to practice financial situations as well, as the reliance on bulk billing for telehealth has reduced practice income considerable. This occurs in the context of increased workload for practice staff – with increase patient contacts from concerns about specific conditions to the simple fact that practices are asking patients to park and ring the clinic from the parking lot, rather than wait in the waiting room. By the start of May, we would expect the acute workforce issues to be slowing, as practices complete their restructuring. Patients and doctors will have adjusted to increased use of telehealth, although we expect a rise in face to face consultations as patients who have stayed away during the time of spread return to practices, and practices relax their isolation conditions.

*Patient impacts*

While Chronic Disease patients and the elderly not only stayed away from regular primary care, there were significant decreases in pathology and radiology and specialist referrals, less preventative care and a change to telehealth activity, which is not always suited to chronic disease care, depending on the patient and associated condition.

## 6. The Time of Consequences – early phase

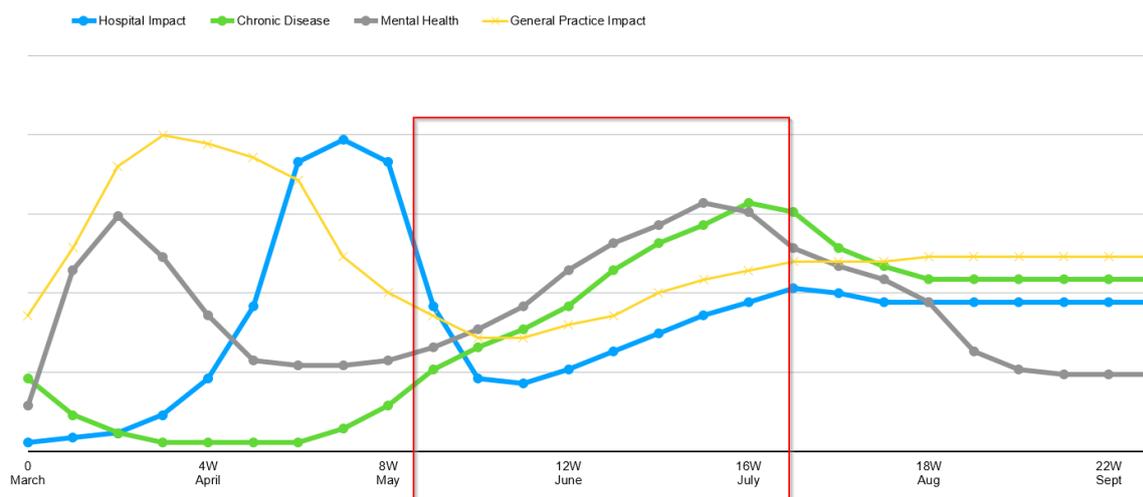


Figure 13. Early Consequences

*Health service impacts*

Despite being relatively early in the pandemic in an Australian context, projections suggest that mid-May through June will be the least disrupted period, with all areas seeing a gradual rise from low-moderate impact to moderate-high impact. As the weather cools and we experience an Australian winter this will likely have a negative impact on health and wellbeing across the community. As mentioned above, a concerted and orchestrated surge of general practice activity which targets those most at risk has the potential to flatten the curve at this point. From a workforce perspective, General Practice will have established a new embedded business model and set of processes. There is the potential for practices to close or reduce their services due to the financial viability of changed care models. The impact on billings of the current policy position which does not permit private billing for some MBS items for general practice is having a significant impact both on practice viability and sentiment in general practice. Some general practices will flourish while other flounder without

assistance, leading to related health consequences for local communities. While still in need of refinement, the new practice models will largely have become the new ‘business as usual’. Hospitals will have passed their initial preparation phases and ICU admissions for COVID-19 will be reducing. This may lead to the sense that a ‘phony war’ is being fought and maintaining staff focus within hospital contexts will be challenging.

*Health impacts*

June to September also marks peak influenza season, noting the potential positive effects of the public health message, influenza immunisations are up 88% in General Practice compared to the same time last year. It may also be that with a lack of ‘herd immunity’ ie, no group within the community that has been exposed to the ‘normal’ Type A & B influenza that once social distancing measures are relaxed we may see a sharp spike in influenza.

The consequences of Chronic Disease patients not presenting to GPs will become more apparent during this time, and the model predicts a rise in presentations throughout June and July. This is likely to have significant effect on both the acute and primary care sectors, who will effectively spend much of this period bringing the chronic disease cohort back to regular ongoing management. With more ‘at risk’ patients attending hospitals or General Practice there comes a greater risk of COVID infection. Given the vulnerability of this cohort that may also lead to an increase in mortality rates.

## 7. The Time of Consequences – late phase

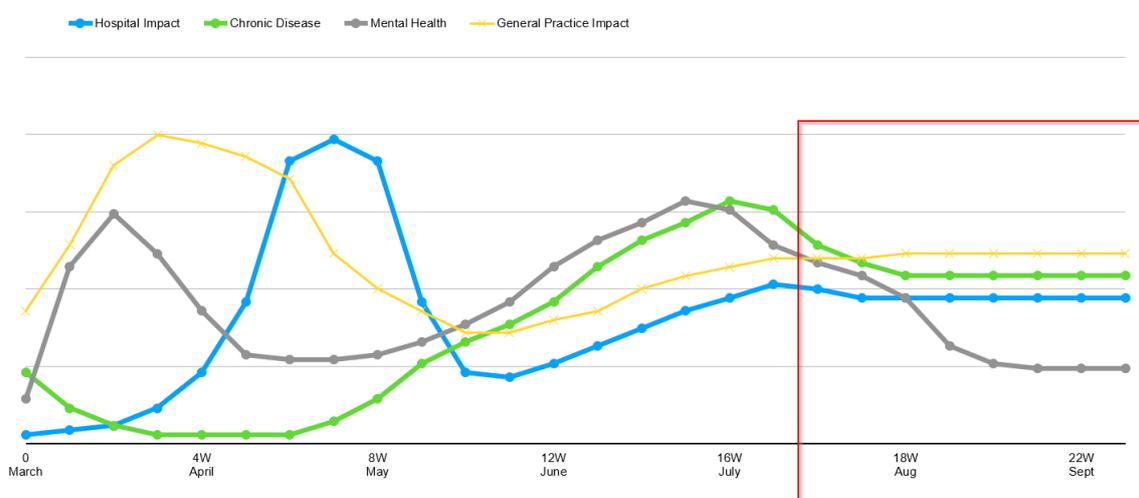


Figure 14. late consequences

*Health service impacts*

The mid July – September period was the most difficult to predict. While the model is based upon the current trends as at Mid-April, changes to social distancing measures or a second prolonged wave of COVID-19 infections may prolong the previous periods. The impact being this period may extend to Christmas or beyond.

Each of the lines remains in either the medium or high impact zones, meaning that while the most acute phases may be over, there will still be a significant impact on the healthcare system as a whole.

How long the overall elevated trend continues for will depend on infection trends and social measures put into place.

## A note about rural general practice

Although rural and remote are underrepresented in our data, there are differences to be noted. We have already observed that the practices in our rural areas of NSW and Victoria responded faster to adopt telehealth, which probably represents that fact that rural GPs have always used telehealth, just never been able to bill for it in the past. They have not therefore had the same level of change anxiety in doing so. Rural GPs are also more likely to be more self-reliant. Rural practice has had to cope with the usual issues of isolation, and relatively low levels of testing as a consequence. Whilst rural practice has been quick to adopt telehealth, the lack of potential recovery resources means rural GPs will be dealing with the wave of mental health issues and chronic disease in the context of the general lack of resources available in rural areas.

## Conclusion

The POLAR Predictive Impact Model uses data from the early experience of the pandemic in General Practice and the hospital sector to predict health service trends. It demonstrates the power of timed and timely access to good quality data. The model indicates the following:

- General Practice has borne the burden of patient care in the early days of the pandemic.
- The nature of General Practice consultations changed in the early days and this will have consequences for both the primary and acute health care sectors.
- General Practice data can operate as the ‘canary in the coal mine’ signalling the likely impact both within the primary and acute sectors.
- Chronic Disease is likely to escalate in importance because people are currently not receiving their usual preventive care and treatment.
- Mental Health is likely to become the biggest issue in the health sector, given the combination of anxiety, isolation, and bushfire trauma.

With more resources and support, additional work could be completed with more fine-grained monitoring of the impact of post COVID-19 diagnoses.

We encourage all health system decision-makers to consider these predicted impacts and early insights and to plan ahead, in particular working with their PHNs to facilitate the changes needed to further enhance the overall system response to the current pandemic situation.

*Acknowledgments and thanks to the practices that contribute data and for their commitment to quality improvement.*

## Next steps

Paper 3 is intended to examine in more detail the structures and impacts around telehealth – usage in different groups and different conditions. We intend to look at rates of referrals and testing in telehealth vs F2F, and similarly conditions treated. Beyond that we will be starting to look at the rates of new diagnoses for conditions such as cancer and diabetes, to attempt to quantify the developing morbidity that may come in the coming months. In addition to the contacts below, if you have feedback and/or questions of the data – contact [kgardner@outcomehealth.org.au](mailto:kgardner@outcomehealth.org.au) and we will put them in the pipeline. This activity remains a service provided by Outcome Health on behalf of the PHNs, as we feel it important to inform policy and planning. It is not funded in any other way.

## Contacts for more information:

**POLAR Research:** A/Prof Chris Pearce. 0417 032 618. [drchrispearce@mac.com](mailto:drchrispearce@mac.com)

**Outcome Health:** Adam McLeod. 0488 347 314. [amcleod@outcomehealth.org.au](mailto:amcleod@outcomehealth.org.au)

**Primary Health Networks:** Dr Elizabeth Deveny. 0400 428 673 [ceo@semphn.org.au](mailto:ceo@semphn.org.au)

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Outcome Health is a Not-For-Profit providing innovative services to the Healthcare sector and Primary Health Networks in particular. The POLAR suite provides advanced data analytics and population health to GPs and PHNs, with an emphasis on delivering outcomes. Data is used to support patient care, population health and research. More information at [www.outcomehealth.org.au](http://www.outcomehealth.org.au)