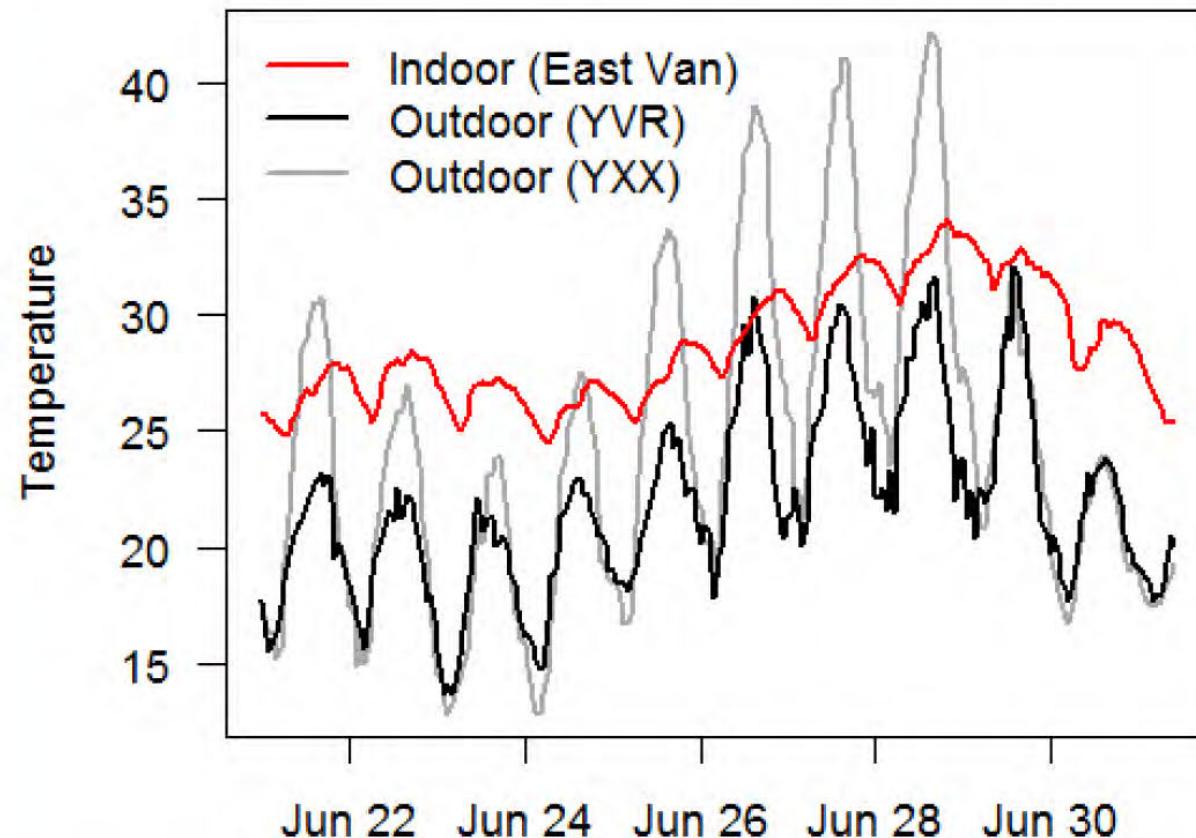
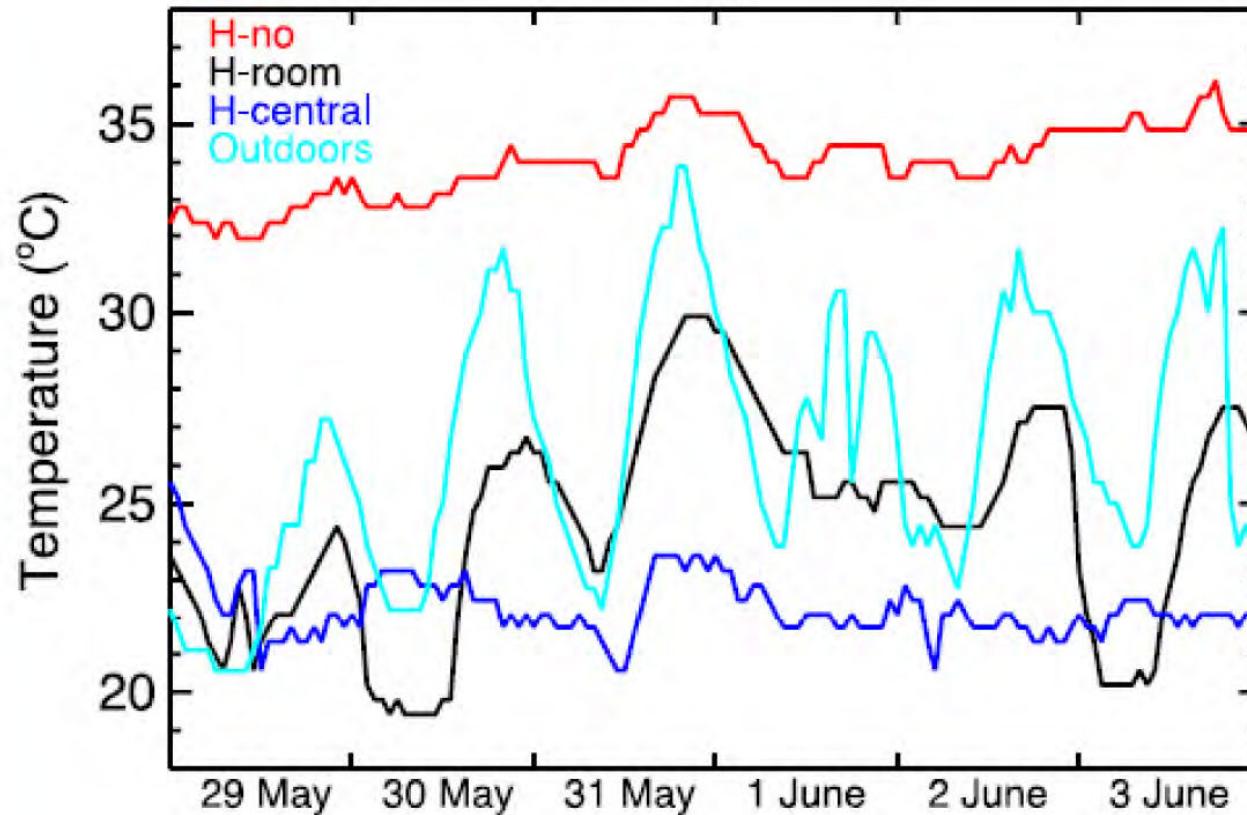


# Heat warnings are based on outdoor temperatures, but health risk greatest with high indoor temperatures.



- Main floor temperatures from older home with no AC during recent event
- Indoor temperatures build day-over-day
- **Indoor temperatures peak during evening and overnight hours**
- It takes days for indoor temperatures to come down after outdoor temperatures decrease

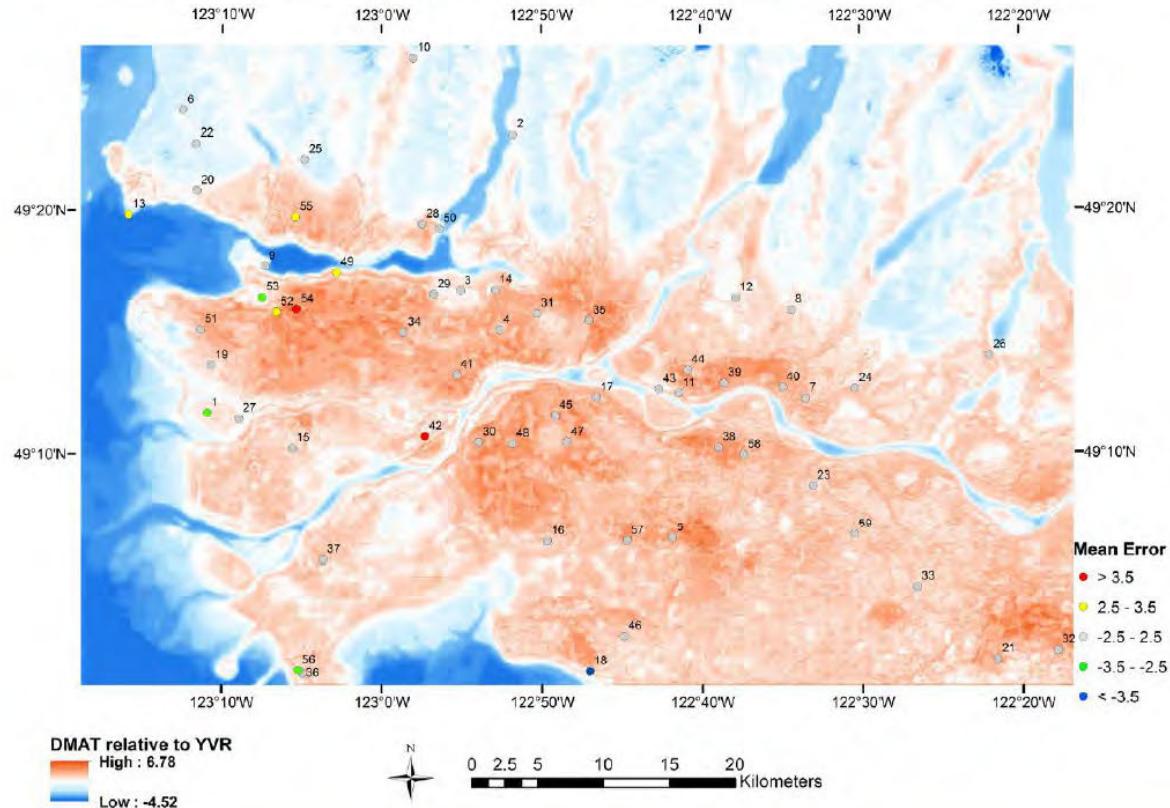
# Indoor temperatures can vary dramatically depending on home characteristics.



- Data from the Baltimore area, but illustrate effect of central and portable AC under temperatures like 2021 event in BC
- Floor of building matters
- Exposure of windows matters

# Outdoor temperatures can also vary dramatically due to the built environment and urban heat island effects.

Daily Maximum Air Temperature (DMAT) relative to YVR



- This map represents the difference between the maximum temperature reported at YVR and other locations in greater Vancouver on hot days using data up to 2010
- Redder areas have a bigger difference, up to 7 degrees

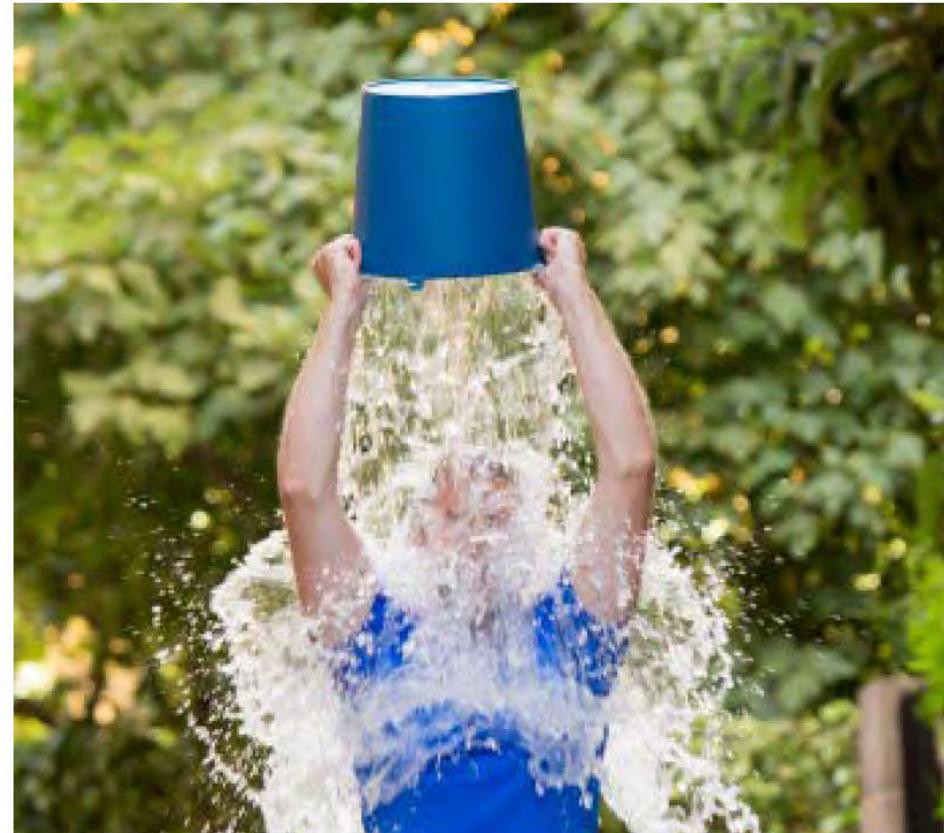
**We need to study the 2021 event in detail to understand more about the specific risk factors.**

- Were there increases in deaths at hospitals, LTCFs, and/or assisted living?
- What were the risk factors at the neighborhood level? Requires spatial linkages to address.
- What were the risk factors at the individual level? Requires linkages to administrative data.
- What were the risk factors at the home level? Requires building-specific information.
- Can any protective factors be identified?

**This was an exceptional event, but there is no guarantee that it will not happen again in summer 2021.**

- Indoor climate control is the most effective protection
- Get mechanical interventions (AC, fans) in place ASAP where possible
- More information about effective passive cooling is needed
  - Keep sun from hitting the outside of windows (awnings, shutters, reflective barriers)
  - Trap cooler air indoors during the heat of the day, open windows at night
  - Use fans to draw cooler night air through the house

We can learn from strategies used in hotter climates where air conditioning is uncommon.



## **Other possible short-term interventions for further extreme hot weather in 2021.**

- Develop messaging about the risks of sleeping in hot indoor environments
  - Consider threshold temperatures for action
  - Use of thermometers, including smart devices for remote surveillance
  - Strategies for staying cooler (hydration before bed, wet top sheet + fan, sleep in coolest room, outdoors, or in garage)
  - Making plans in advance for alternate arrangements
- Develop high risk rosters from evidence and registries
- Support HAs in contacting vulnerable individuals
- Control indoor temperatures where possible: hospitals, care facilities.

## **Even if there are no further events in 2021, there will be similar events in future summers.**

- Comfortable indoor living spaces are needed to protect the BC population from heat
- Promote greenery, shade, shutters, fans, heat pumps, and AC
- Consider requiring AC in hospitals, LTCFs, and assisted living
- Consider the development of overnight cooling areas during extreme heat events
- Promote social connections and cohesion
- Support smaller and remote regions in development of heat response plans

**From:** [Lysyshyn, Mark \[VCH\]](#)  
**To:** [Lavery, John \[PHSA\]](#)  
**Cc:** [Henderson, Sarah \[BCCDC\]](#); [Daly, Patty \[VCH\]](#); [Tyler, Ingrid \[FH\]](#); [Brodkin, Elizabeth Dr. \[FH\]](#); [Phillips, Mark \[VCH\]](#); [Laberge, Maddy \[PHSA\]](#); [Spence, Nicole \[PHSA\]](#)  
**Subject:** Re: Support for EMBC to end heatwave financial support  
**Date:** Tuesday, July 06, 2021 5:19:19 PM

---

**s.13(1)** [REDACTED] Thanks John.

Mark Lysyshyn MD MPH FRCPC  
Deputy Chief Medical Health Officer  
Vancouver Coastal Health  
mobile: 604 506 3769  
office: 604 675 3878  
email: mark.lysyshyn@vch.ca

On Jul 6, 2021, at 3:40 PM, Lavery, John [PHSA] wrote:

Hi everyone, I'm writing to get your support for Emergency Management BC to end its current funding for incremental costs for cooling centres.

<!--[if !supportLists]-->•<!--[endif]-->EMBC provides local governments with incremental costs for cooling centre operations when there is a heatwave warning from Environment and Climate Change Canada.  
<!--[if !supportLists]-->•<!--[endif]-->They normally continue paying those incremental costs up to 72 hours after the warning has ended, to provide time for buildings to cool.  
<!--[if !supportLists]-->•<!--[endif]-->The heatwave warning in the lower mainland was ended on Friday, July 2<sup>nd</sup> and so the financial support should have ended on the 5<sup>th</sup>. EMBC is proposing ending the financial support at the end of the day on July 7<sup>th</sup>, but they would like support from public health before they make this change.  
<!--[if !supportLists]-->•<!--[endif]-->Interior Health (Sue Pollock) has approved this approach with EMBC in their region.

Are you supportive of this approach?

My best,

John

John Lavery  
Executive Director  
Health Emergency Management British Columbia (HEMBC)  
Provincial Health Services Authority  
#200–1333 W. Broadway  
Vancouver, BC, Canada V6H 4C1

Mobile/WhatsApp: **s.15(1)(l)**  
**After hours on call:** **s.15(1)(l)**  
[john.lavery@phsa.ca](mailto:john.lavery@phsa.ca)

Twitter: [@bchealthem](https://twitter.com/bchealthem)

**From:** Henderson\_Sarah [BCCDC]  
**To:** Gustafson\_Reka [BCCDC]; Henry\_Bonnie [EXTI]  
**Cc:** Kosatsky\_Tom [BCCDC]; McVea\_David [BCCDC]; Sandhu\_Jat [BCCDC]  
**Subject:** Re: Early information on mortality during extreme hot weather  
**Date:** Wednesday, July 07, 2021 11:48:15 AM

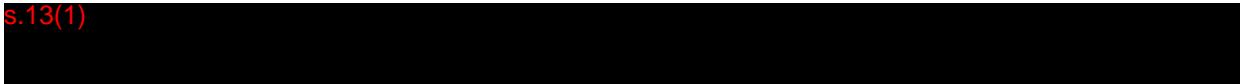
---

Hi both –

Interesting that our early assessment is consistent with what you have heard, Bonnie.

Kathleen is working the same plots by age category and similar plots for ambulance dispatch codes (will likely have both for tomorrow). Once the data are complete for the heatwave and aftermath, we will link all deaths to their local temperature data and conduct a quick case-only study similar to the one we did for the 2009 event. We have much better data available now, so it will provide some good preliminary information to work from.

s.13(1)



Thanks,  
Sarah

---

Sarah B. Henderson, PhD  
Scientific Director | Environmental Health Services | BCCDC  
Associate Professor (Partner) | School of Population and Public Health | UBC  
Office: 604.707.2449

Cell: [s.15\(1\)\(i\)](#)  
[#DifferentTogether](#)  
[#InPlainSight](#)

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---

**From:** "Gustafson, Reka [BCCDC]"  
**Date:** Wednesday, July 7, 2021 at 11:10 AM  
**To:** Bonnie Henry , "Henderson, Sarah [BCCDC]"  
**Cc:** "Kosatsky, Tom [BCCDC]" , David McVea , Jat Sandhu  
**Subject:** RE: Early information on mortality during extreme hot weather

Thank you very much Sara. Can we also look at:

1. Age of those who died
2. Location of death—correlated with temperature.
3. Mortality in the days following the heat.

I think it will be really important to look at PYLL in the month overall. Hopefully, with Lisa LaPointe, we can have a look at the real contributors to the PYLL.

Thanks very much,

Reka

**Dr. Réka Gustafson MD FRCPC**  
Vice President, Public Health and Wellness, PHSA & Deputy Provincial Health Officer  
Provincial Health Services Authority

---

**Vacation upcoming: July 26 – Aug 6, 2021**

---

**From:** Henry, Bonnie HLTH:EX  
**Sent:** Wednesday, July 07, 2021 11:03 AM  
**To:** Henderson, Sarah [BCCDC]  
**Cc:** Gustafson, Reka [BCCDC] ; Kosatsky, Tom [BCCDC] ; McVea, David [BCCDC] ; Sandhu, Jat [BCCDC]  
**Subject:** RE: Early information on mortality during extreme hot weather  
**EXTERNAL SENDER.** If you suspect this message is malicious, please forward to [spam@phsa.ca](mailto:spam@phsa.ca) and **do not** open attachments or click on links.

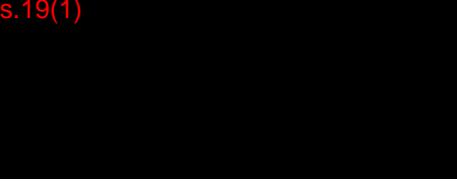
---

Thanks, that is really helpful and interesting. I am hearing reports from physicians that although reports may have been increased to the coroner because of awareness, the deaths were not heat related in many cases.

B

*Dr Bonnie Henry  
Provincial Health Officer  
Office of the PHO*

s.19(1)



I gratefully acknowledge that I live and work on the traditional unceded territory of the Lekwungen Peoples, specifically the Songhees and Esquimalt First Nations. Hay'sxw'qu Si'ems

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**From:** Henderson, Sarah [BCCDC] <[Sarah.Henderson@bccdc.ca](mailto:Sarah.Henderson@bccdc.ca)>

**Sent:** July 7, 2021 10:52 AM

**To:** Henry, Bonnie HLTH:EX

**s.19(1)**



**Cc:** Gustafson, Reka HLTH:IN <[reka.gustafson@phsa.ca](mailto:reka.gustafson@phsa.ca)>; XT:HLTH Kosatsky, Tom <[tom.kosatsky@bccdc.ca](mailto:tom.kosatsky@bccdc.ca)>; McVea, David [BCCDC]

<[David.McVea@bccdc.ca](mailto:David.McVea@bccdc.ca)>; Sandhu, Jatinder HLTH:IN <[jat.sandhu@bccdc.ca](mailto:jat.sandhu@bccdc.ca)>

**Subject:** Early information on mortality during extreme hot weather

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Bonnie and all –

We are now starting to see the impacts of the hot weather event in the vital statistic mortality data. Please see the attached plot below.

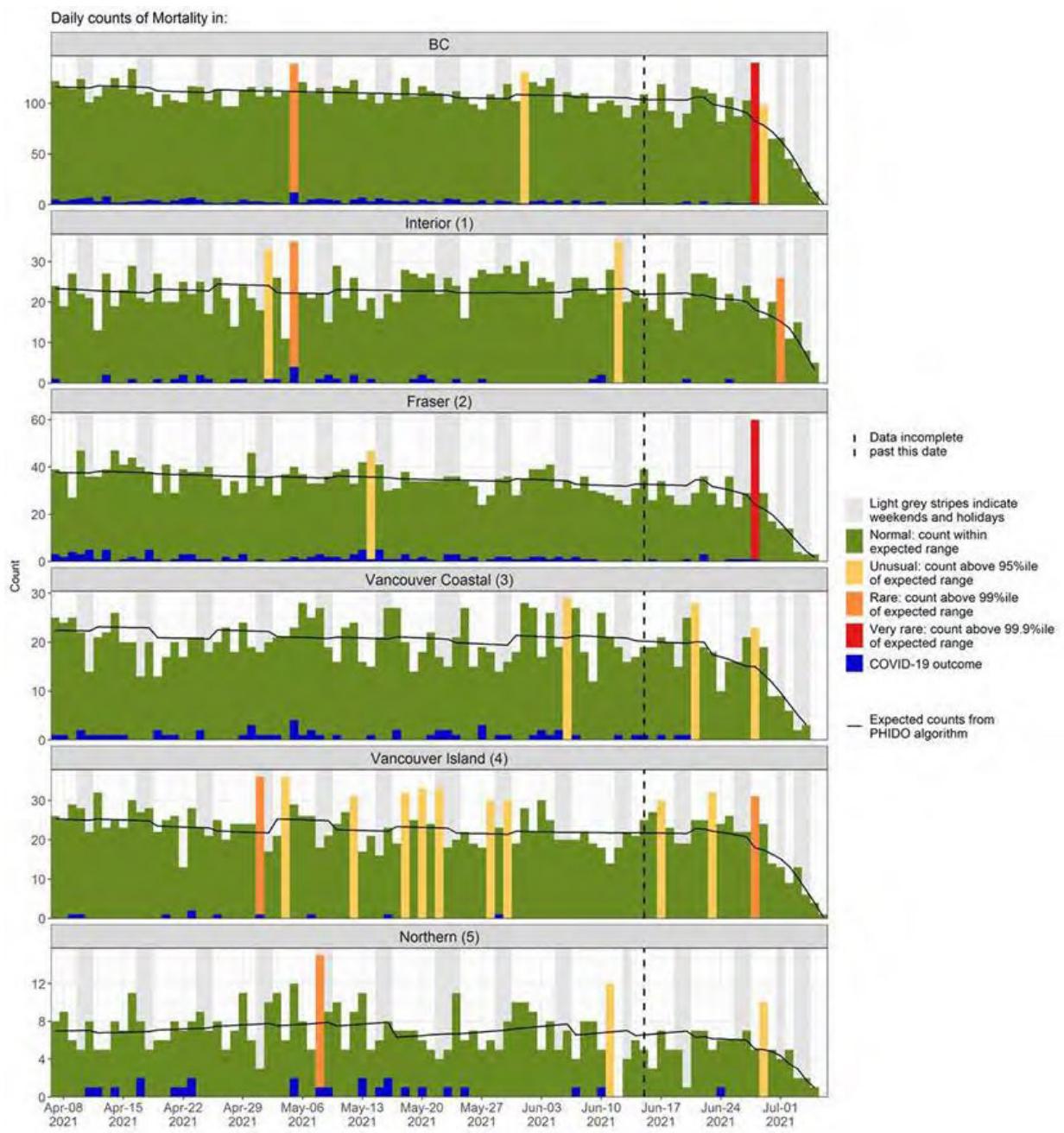
Key points:

1. The red bar in the all BC plot is Monday June 28<sup>th</sup>, the hottest day.
2. Frankly, I am surprised that there is no clear signal of increased mortality on the days before the 28<sup>th</sup> at this time.
3. The data are not yet complete. If registrations haven't slowed down significantly, they should be about 75% complete.
4. Impact appears greatest in Fraser Health at this time. Fraser Health also tends to register deaths faster than other HAs.
5. So far, these plots are not consistent with the ~500 excess reports to the Coroners service. If the % above expected patterns hold as the data become more complete, I'd estimate maybe 200-300 excess deaths in the province overall. I think we need to be prepared for the situation that the **proportion** of deaths reported to the Coroners Service was dramatically shifted during the hot weather event, but that total excess mortality may end up being less than the absolute increase has suggested.

We will keep an eye on this through the week of course, and I'll update accordingly. We should be able to make a preliminary estimate of excess mortality by this time next week, and a more firm estimate the following week. I just wanted to let you know where things are at.

Cheers,

Sarah



Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: §.13(1)

[#DifferentTogether](#)

[#InPlainSight](#)

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**From:** [Amos, Heather \[BCCDC\]](#)  
**To:** [Henderson, Sarah \[BCCDC\]](#)  
**Cc:** [Gustafson, Reka \[BCCDC\]](#); [Kosatsky, Tom \[BCCDC\]](#)  
**Subject:** Re: CTV news story  
**Date:** Wednesday, July 07, 2021 10:53:01 PM

---

Thanks Sarah. CTV did not attempt to contact us (bccdc) for this story. They have reached out to other phsa programs as you are aware from the article.

I appreciate the background and that the plan was activated in June 25.

Heather

Sent from my iPhone

On Jul 7, 2021, at 10:49 PM, Henderson, Sarah [BCCDC] wrote:

Hi Heather –

A friend brought this news story to my attention:

<https://bc.ctvnews.ca/documents-offered-guidelines-warned-of-deadly-consequences-ahead-of-b-c-heat-wave-1.5501112>

The journalist did not attempt to speak with us about this work to the best of my knowledge. The plan outlined in this article actually was activated on June 25<sup>th</sup> – she fails to mention that.

Anyhow, not sure if any blowback will come your way but I wanted you to know. I've cc'd Reka and Tom as well.

Cheers,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: [§.15\(1\)\(l\)](#)

[\*\*#DifferentTogether\*\*](#)

[\*\*#InPlainSight\*\*](#)

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**From:** Henderson\_Sarah [BCCDC]  
**To:** Gustafson\_Reka [BCCDC]; Henry\_Bonnie [EXT]  
**Cc:** Kosatsky\_Tom [BCCDC]; McVea\_David [BCCDC]; Sandhu\_Jat [BCCDC]  
**Subject:** RE: Early information on mortality during extreme hot weather  
**Date:** Thursday, July 08, 2021 2:01:39 PM  
**Attachments:** mortality\_2021-07-08.png  
mortality\_phido\_plot\_age\_group.png  
1\_total\_dispatches.png

---

Hi all –

Please find attached:

- 1) The same plot as yesterday, updated with the new registrations available as of this morning (mortality\_2021-07-08.png).
- 2) The same data, shown by four different age categories (mortality\_phido\_plot\_age\_group.png).
- 3) A similar plot for total daily ambulance dispatches (1\_total\_dispatches.png). The CARD codes most increased for dispatches were: (A) breathing problems; (B) cardiac/respiratory arrest; (C) heat/cold exposure; and (D) unconscious/fainting. Note that CARD codes are based on information provided by callers to the dispatchers, and quite different from paramedic impressions, which are more diagnostic. We do not receive data on paramedic impressions.

Please let me know if you have any questions,

Sarah

---

Sarah B. Henderson, PhD  
Scientific Director | Environmental Health Services | BCCDC  
Associate Professor (Partner) | School of Population and Public Health | UBC  
Office: 604.707.2449

Cell: **s.15(1)(l)**  
**#DifferentTogether**  
**#InPlainSight**

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**From:** Gustafson, Reka [BCCDC]  
**Sent:** Wednesday, July 07, 2021 11:10 AM  
**To:** Henry, Bonnie [EXT]; Henderson, Sarah [BCCDC]  
**Cc:** Kosatsky, Tom [BCCDC]; McVea, David [BCCDC]; Sandhu, Jat [BCCDC]  
**Subject:** RE: Early information on mortality during extreme hot weather

Thank you very much Sara. Can we also look at:

1. Age of those who died
2. Location of death—correlated with temperature.
3. Mortality in the days following the heat.

I think it will be really important to look at PYLL in the month overall. Hopefully, with Lisa LaPointe, we can have a look at the real contributors to the PYLL.

Thanks very much,

Reka  
**Dr. Réka Gustafson MD FRCPC**  
Vice President, Public Health and Wellness, PHSA & Deputy Provincial Health Officer  
Provincial Health Services Authority

---

**Vacation upcoming: July 26 – Aug 6, 2021**

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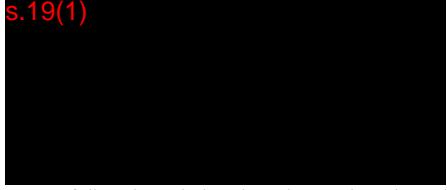
**From:** Henry, Bonnie HLTH:EX  
**Sent:** Wednesday, July 07, 2021 11:03 AM  
**To:** Henderson, Sarah [BCCDC]  
**Cc:** Gustafson, Reka [BCCDC] ; Kosatsky, Tom [BCCDC] ; McVea, David [BCCDC] ; Sandhu, Jat [BCCDC]  
**Subject:** RE: Early information on mortality during extreme hot weather  
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Thanks, that is really helpful and interesting. I am hearing reports from physicians that although reports may have been increased to the coroner because of awareness, the deaths were not heat related in many cases.

B

*Dr Bonnie Henry  
Provincial Health Officer  
Office of the PHO  
Ministry of Health*

S.19(1)



I gratefully acknowledge that I live and work on the traditional unceded territory of the Lekwungen Peoples, specifically the Songhees and Esquimalt First Nations. Hay'sxw'qu Si'ems

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**From:** Henderson, Sarah [BCCDC] <[Sarah.Henderson@bccdc.ca](mailto:Sarah.Henderson@bccdc.ca)>

**Sent:** July 7, 2021 10:52 AM

**To:** Henry, Bonnie HLTH:EXs.19(1)

**Cc:** Gustafson, Reka HLTH:IN <[reka.gustafson@phsa.ca](mailto:reka.gustafson@phsa.ca)>; XT:HLTH Kosatsky, Tom <[tom.kosatsky@bccdc.ca](mailto:tom.kosatsky@bccdc.ca)>; McVea, David [BCCDC] <[David.McVea@bccdc.ca](mailto:David.McVea@bccdc.ca)>; Sandhu, Jatinder HLTH:IN <[jat.sandhu@bccdc.ca](mailto:jat.sandhu@bccdc.ca)>

**Subject:** Early information on mortality during extreme hot weather

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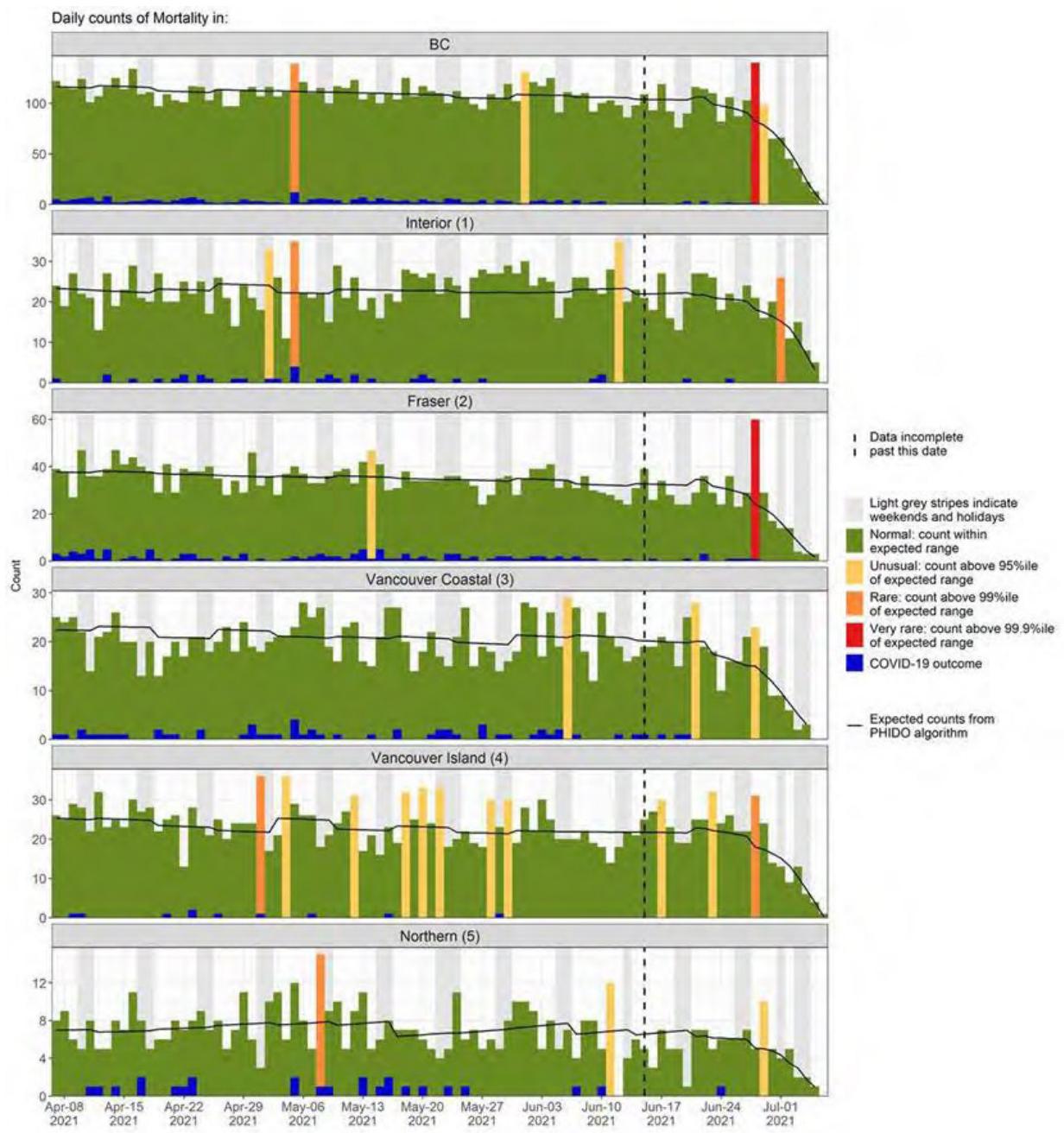
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Cheers,  
Sarah



Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

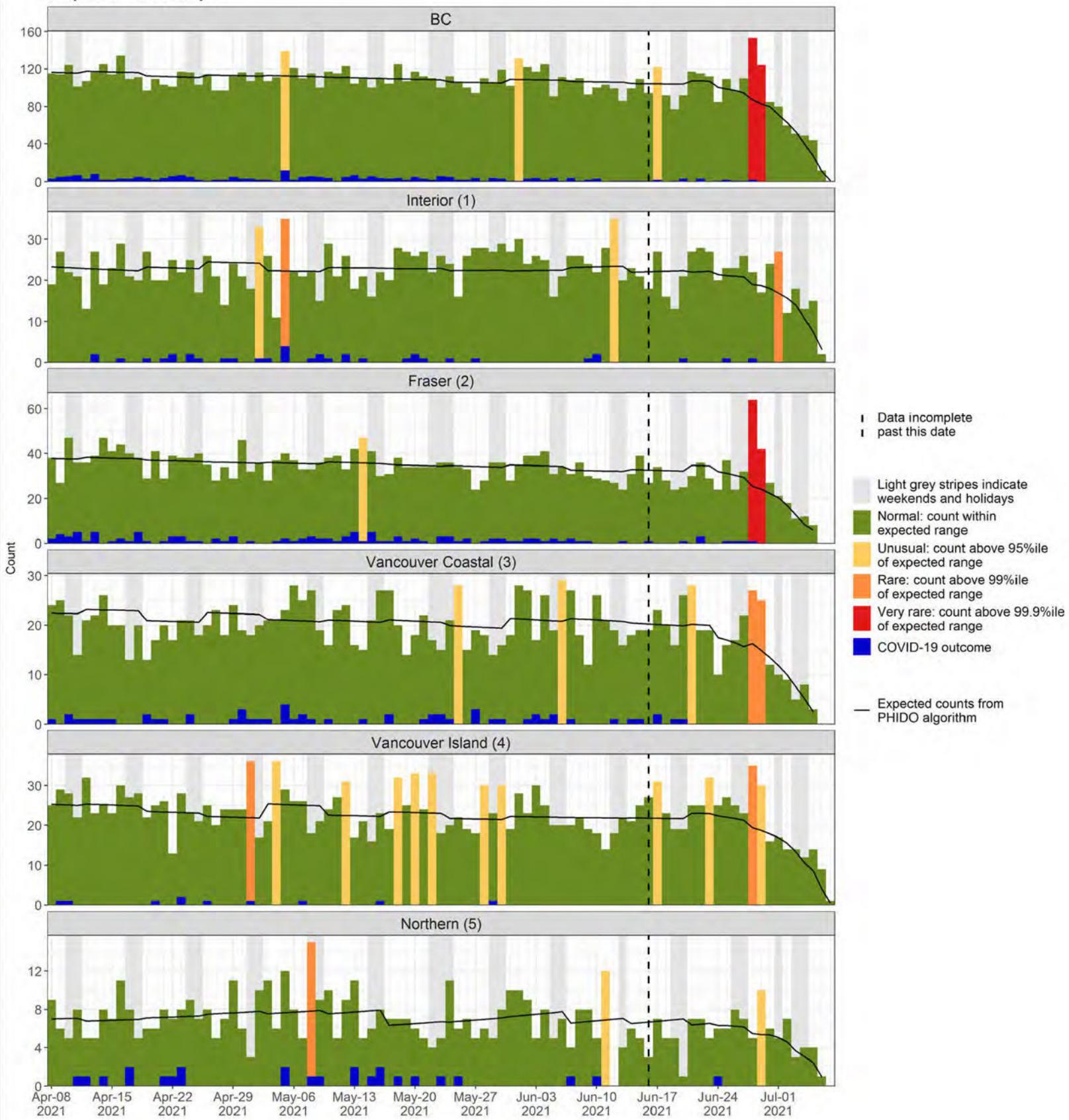
Cell: **s.15(1)(l)**

**#DifferentTogether**

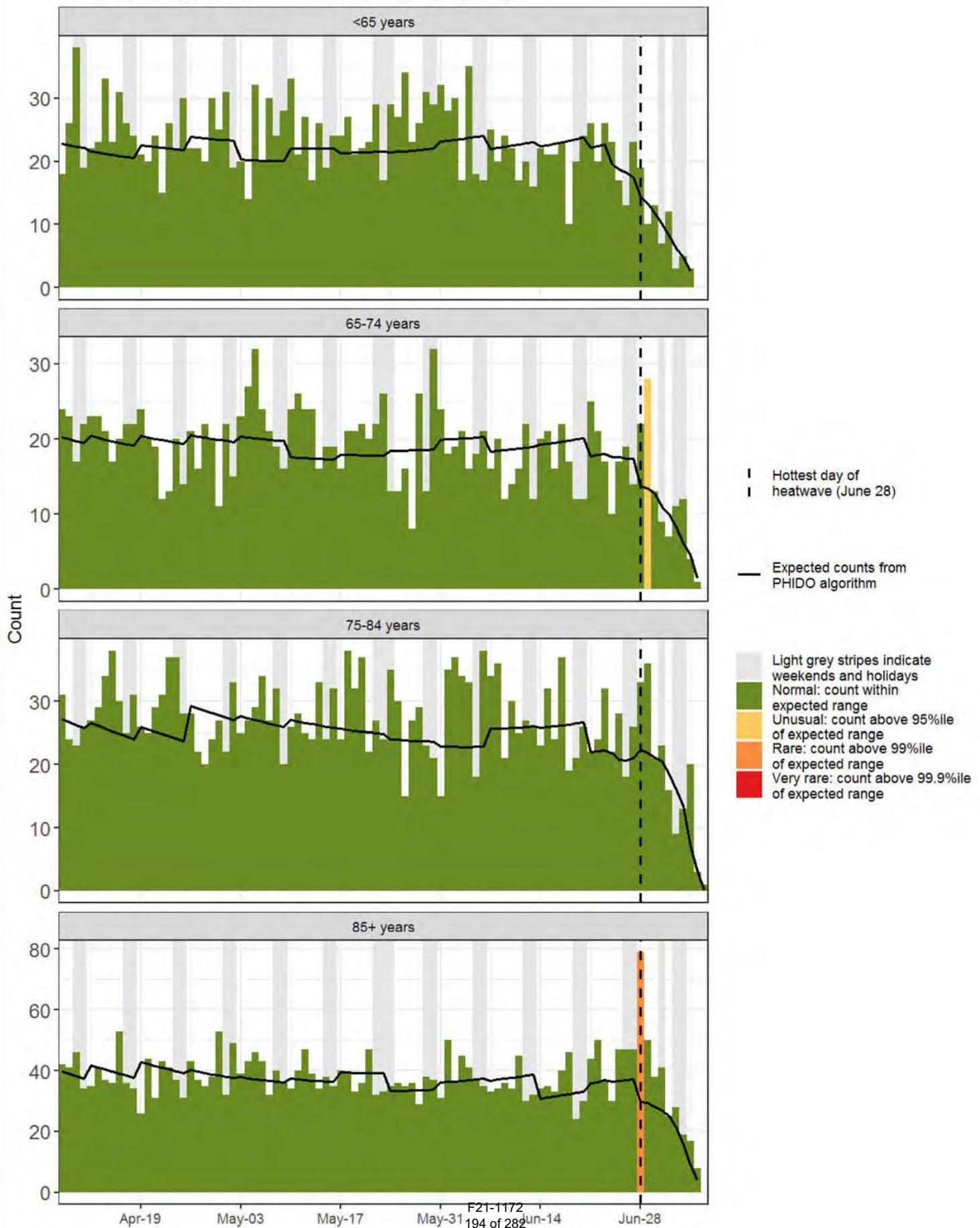
**#InPlainSight**

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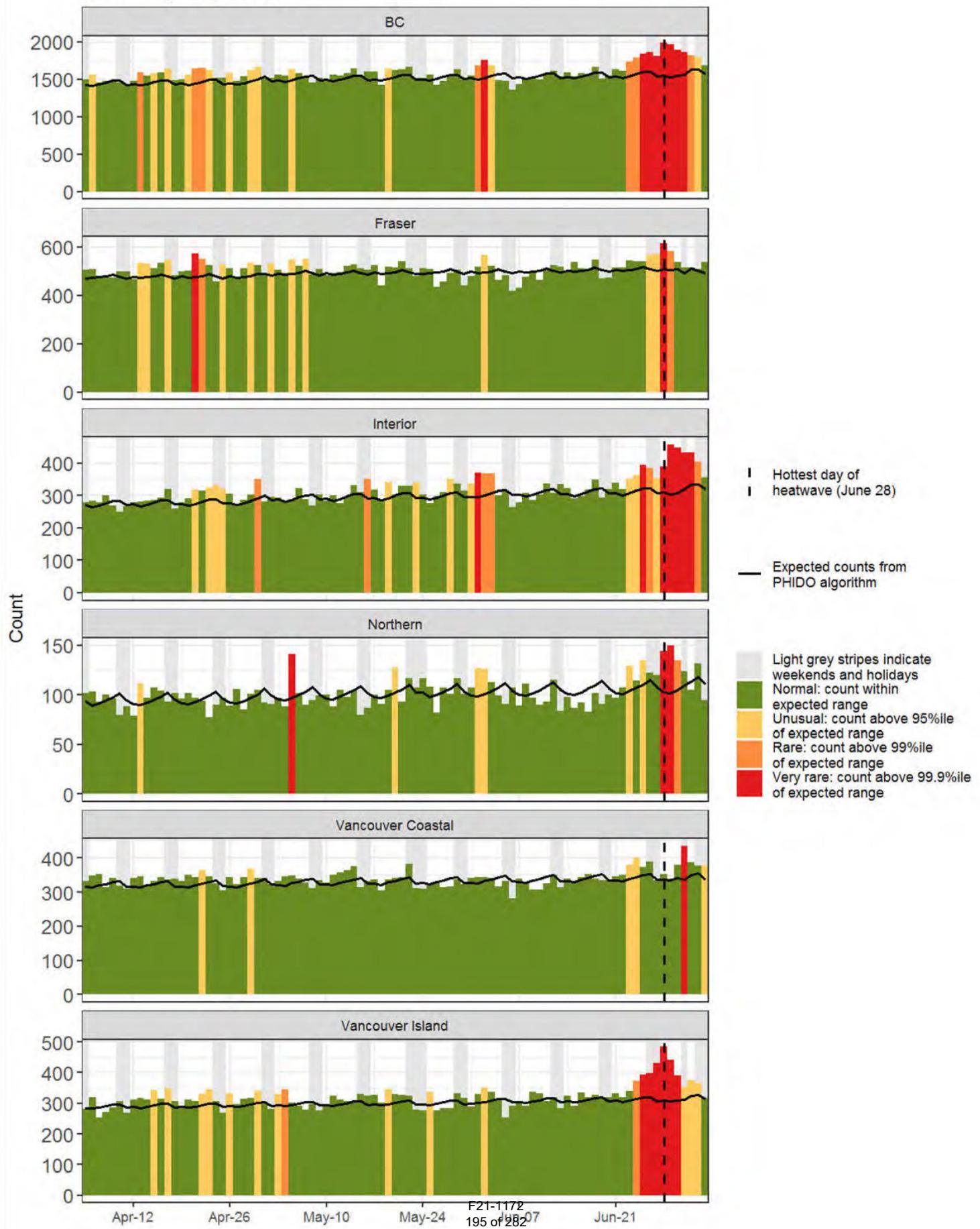
Daily counts of Mortality in:



## Daily mortality in British Columbia by age group



## Total daily dispatches



**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Ashley.Halicki@gov.bc.ca](#); [Gustafson, Reka \[BCCDC\]](#); [McVea, David \[BCCDC\]](#); [Kosatsky, Tom \[BCCDC\]](#)  
**Cc:** [Tsui, Gigi \[BCCDC\]](#); [Henderson, Marianne \[BCCDC\]](#)  
**Subject:** RE: Meeting Request re: Heat Wave Deaths  
**Date:** Monday, July 12, 2021 9:19:03 AM

---

Hi Ashley –

**s.22(1)** [REDACTED] so I've filled this in for the sake of speed. Below are the times that work for Dr. Kosatsky, Dr. McVea, and me (in red). I cannot see Dr. Gustafson's complete calendar, so I will let Marianne address that.

**Wednesday, July 14**

9:30am-11:30am / **09:30-10:00**  
4:00pm-5:00pm / **16:00-16:30**

**Thursday, July 15**

8:00am-9:00am / **NA**

**Friday, July 16**

2:30pm-5:00pm / **14:30-16:30**

Cheers,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: **s.15(1)(l)** [REDACTED]

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**From:** Halicki, Ashley HLTH:EX [mailto:[Ashley.Halicki@gov.bc.ca](mailto:Ashley.Halicki@gov.bc.ca)]

**Sent:** Monday, July 12, 2021 8:40 AM

**To:** Henderson, Sarah [BCCDC]; Lapointe, Lisa PSSG:EX; Baidwan, Jatinder PSSG:EX; [tej.sidhu@gov.bc.ca](mailto:tej.sidhu@gov.bc.ca) [EXT]; Gustafson, Reka [BCCDC]; McVea, David [BCCDC]; Kosatsky, Tom [BCCDC]  
**Cc:** Smallwood, Susan PSSG:EX; Henderson, Marianne [BCCDC]; Tsui, Gigi [BCCDC]

**Subject:** Meeting Request re: Heat Wave Deaths

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---

Good morning,

On behalf of Dr. Henry, I am reaching out this morning in effort to schedule a 30-minute meeting with you all regarding a review of the heat related deaths from a couple of weeks ago. She would like to aim for this week if possible. I have listed some dates/times below. Please advise which option works best for your calendar:

**Tuesday, July 13**

8:00am-10:00am  
1:30pm-5:00pm

**Wednesday, July 14**

9:30am-11:30am

4:00pm-5:00pm

**Thursday, July 15**

8:00am-9:00am

**Friday, July 16**

2:30pm-5:00pm

Thank you,

**Ashley Halicki | Executive Administrative Assistant**

Office of the Provincial Health Officer, Ministry of Health

Offering acknowledgement in respect of the Lekwungen-speaking peoples, traditional keepers of this land, and the Songhees, Esquimalt, and WSÁNEĆ peoples whose historical relationships with this land continue today.

*This message, including any attachments to it, is not to be disclosed outside of the Provincial Government without prior written approval from the Ministry of Health. If you have received this communication in error, please destroy the email message and any attachments immediately and notify me by telephone or by email.*

**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Henry, Bonnie \[EXT\]](#); [Gustafson, Reka \[BCCDC\]](#); [McVea, David \[BCCDC\]](#); [Kosatsky, Tom \[BCCDC\]](#)  
**Subject:** RE: Heat Related Deaths Review  
**Date:** Friday, July 16, 2021 2:38:49 PM  
**Attachments:** [mortality\\_2021-07-16.png](#)

---

Hi all –

Just showing you the mortality data as of today. There definitely has been a flurry of later-than-usual registrations. Excess mortality still not looking as high as 500, but we'll see how things are on Tuesday when I would expect the next big jump in registrations (Friday-Sunday always slow). Regardless of any discrepancy with the BCCS, the impacts are clear.

Thanks,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: [s.15\(1\)\(l\)](#)

[\*\*#DifferentTogether\*\*](#)

[\*\*#InPlainSight\*\*](#)

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**From:** Henderson, Sarah [BCCDC]  
**Sent:** Wednesday, July 14, 2021 5:45 PM  
**To:** Henry, Bonnie [EXT]; Gustafson, Reka [BCCDC]; McVea, David [BCCDC]; Kosatsky, Tom [BCCDC]  
**Subject:** RE: Heat Related Deaths Review

Hi Bonnie and all,

Thanks for coordinating the call today. Very interesting to see how the BCCS is tackling this. I'm not aware of any such effort around the 2009 event, but Taj says that he will ask around

about it.

It is clear that the BCCS must remain independent in its investigation, and we will continue epidemiologic investigation with the tools available to us: administrative and geographic data linkages that can help to elucidate the patterns of importance. I will hope that we can bring the efforts together in due time.

We have agreed that our team should meet with Taj weekly over the next few weeks, to touch base on progress.

One thing: towards the end of the conversation, Tej did state that most temporary certificates needed to register deaths have been issued by now. I'm prepared to be surprised, but I really don't think the Vital Statistics data are going to shift by another 200 deaths at this point. I think we do have to prepare for significant discrepancy between estimated excess mortality and excess reports to the BCCS. We will keep a close eye on the data for the next week or two, but there have not been big shifts over the past two days.

We should have early estimates available to share next week, and I've asked Kathleen to produce them daily as of Monday so that we can evaluate how stable the data are.

Thanks,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: s.15(1)(l)

**#DifferentTogether**

**#InPlainSight**

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-----Original Appointment-----

**From:** Henry, Bonnie HLTH:EX s.19(1)

**Sent:** Monday, July 12, 2021 10:26 AM

**To:** Henry, Bonnie HLTH:EX; Henderson, Sarah [BCCDC]; Lapointe, Lisa PSSG:EX; Baidwan, Jatinder

PSSG:EX; tej.sidhu@gov.bc.ca [EXT]; Gustafson, Reka [BCCDC]; McVea, David [BCCDC]; Kosatsky, Tom [BCCDC]

**Subject:** Heat Related Deaths Review

**When:** Wednesday, July 14, 2021 4:00 PM-4:30 PM (UTC-08:00) Pacific Time (US & Canada).

**Where:** Skype Meeting

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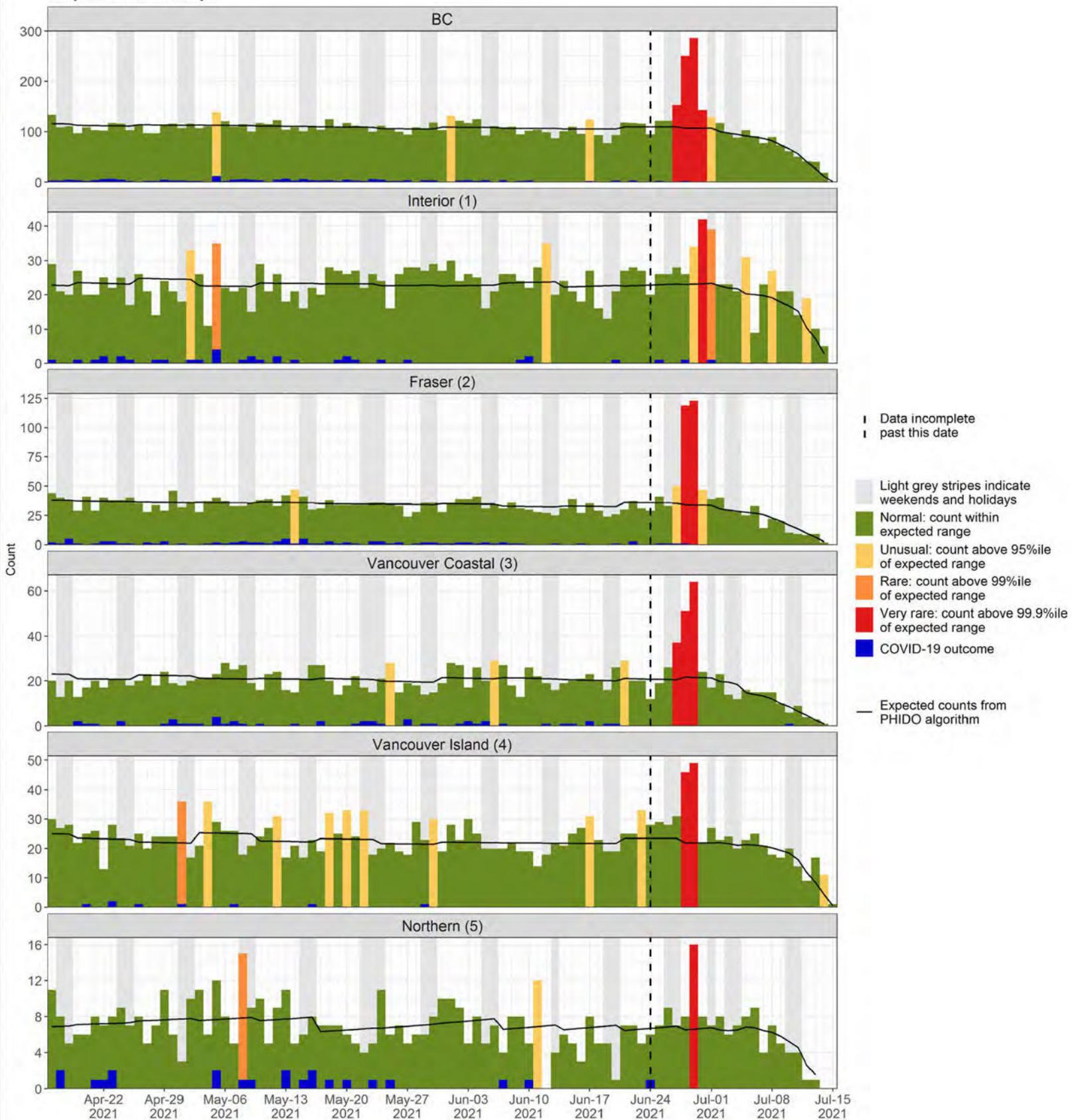
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Daily counts of Mortality in:



**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Henry, Bonnie \[EXT\]](#); [Gustafson, Reka \[BCCDC\]](#); [Kosatsky, Tom \[BCCDC\]](#); [McVea, David \[BCCDC\]](#); ["Baidwan, Jatinder PSSG:EX"](#)  
**Subject:** Update on hot weather mortality  
**Date:** Monday, July 19, 2021 12:43:40 PM  
**Attachments:** [mortality\\_phido\\_plot\\_2021-07-19.png](#)  
[mortality\\_phido\\_plot\\_age\\_group\\_2021-07-19.png](#)  
[mortality\\_phido\\_plot\\_ltc\\_2021-07-19.png](#)

---

Hi all –

Much as Taj (cc'd) predicted, we have had a rush of much later-than-usual registrations in the vital statistics data. I am including plots for all-cause mortality by HA, age category, and setting of death with data updated as of this morning. Under normal circumstances we would expect the data to be about 98% complete by now for the hottest days, but I think we will probably have to hang on through next week before we can make stable estimates of excess deaths. The plot by setting of death is most telling. We will start mapping these deaths later in the week, and looking at key indicators such as surrounding green space and neighborhood deprivation.

With sadness,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

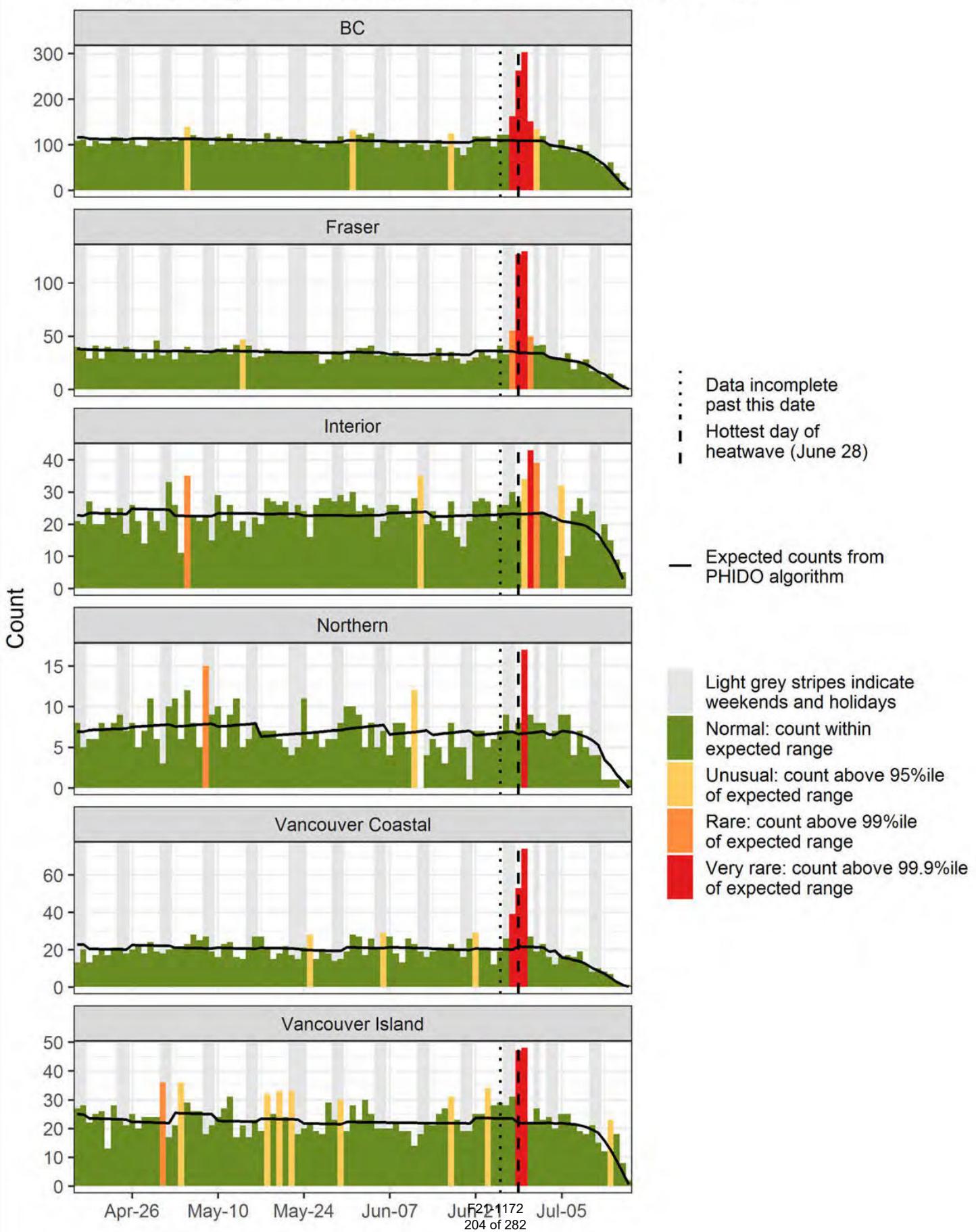
Cell: [s.15\(1\)\(l\)](#)

[\*\*#DifferentTogether\*\*](#)

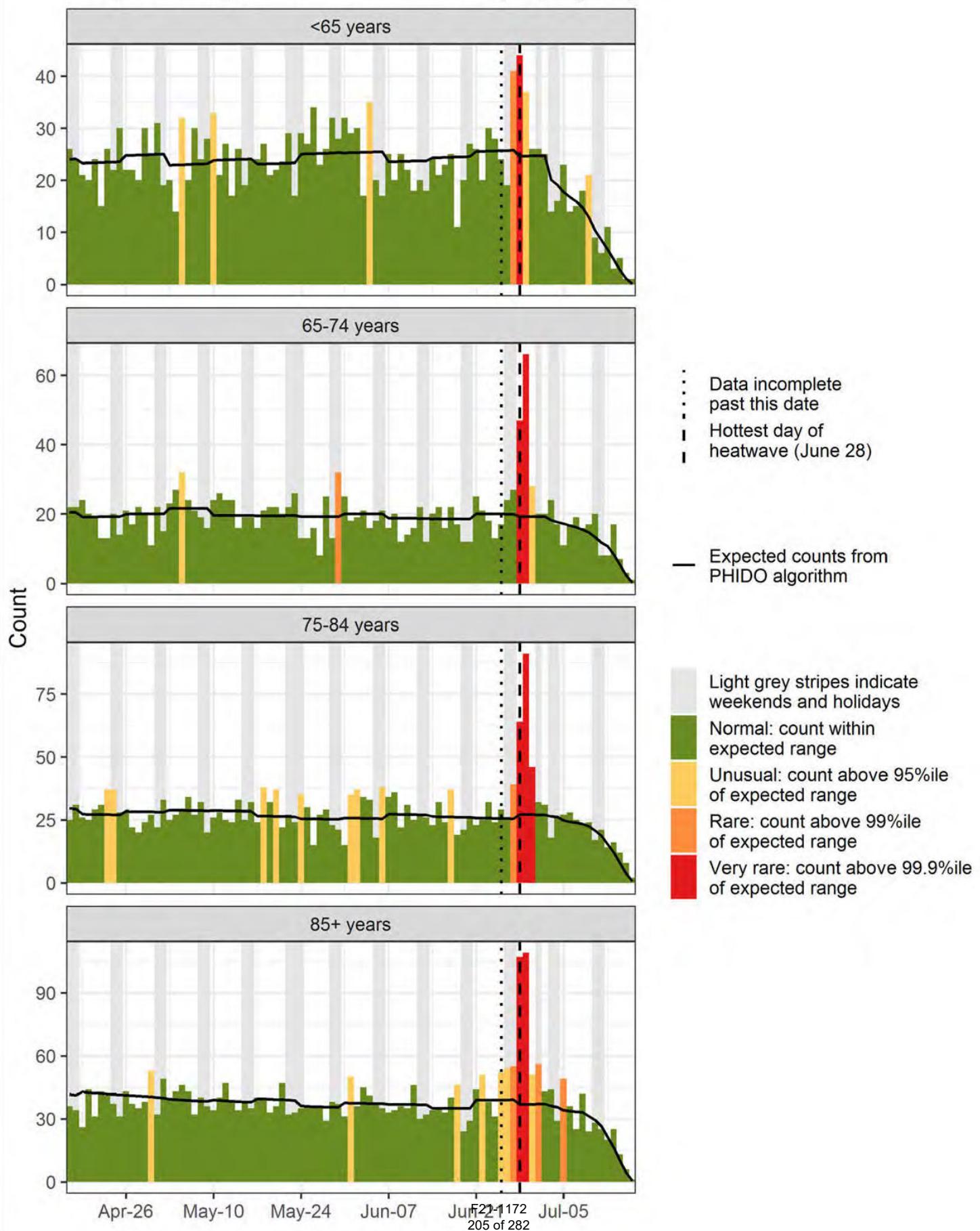
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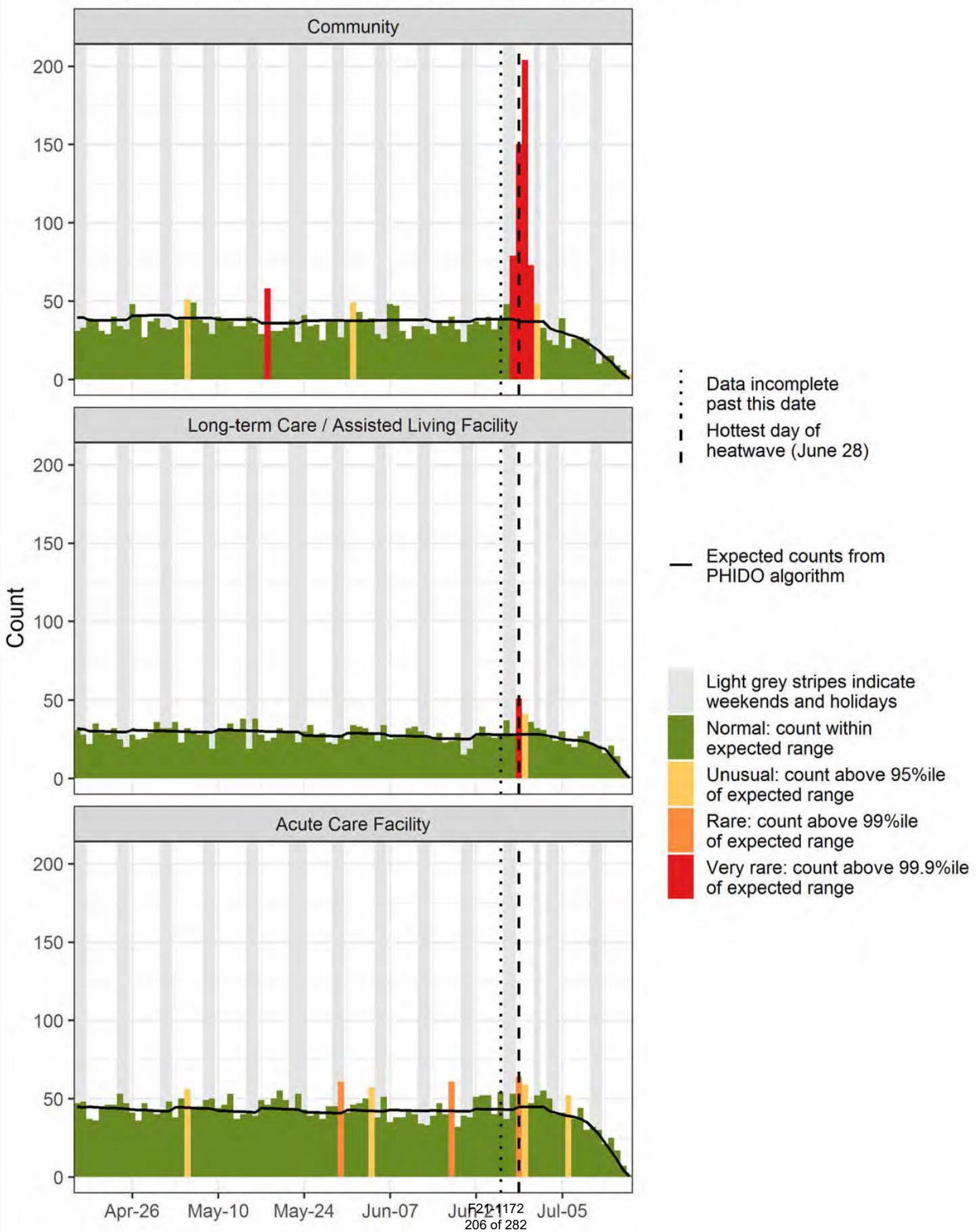
## Daily mortality in British Columbia and health authorities



## Daily mortality in British Columbia by age group



## Daily mortality in British Columbia by setting of death



**From:** [McVea, David \[BCCDC\]](#)  
**To:** [McKee, Geoffrey \[BCCDC\]](#); [Sandhu, Jat \[BCCDC\]](#)  
**Cc:** [Henderson, Sarah \[BCCDC\]](#); [Kosatsky, Tom \[BCCDC\]](#)  
**Subject:** Heat event survey  
**Date:** Tuesday, July 20, 2021 10:47:26 AM

---

Hi Jat and Geoff –

Thanks for taking the time to discuss the possibility of using some aspects of the SPEAK survey to investigate the heat event.

Sarah, Tom and I have take some time to discuss carefully and we are going to table this for now – we have a large amount of data to work through (detailed indoor and outdoor temperature data, linked mortality records) and what we learn from this would guide what we think needs to be asked of the public.

So, no immediate need for us to investigate using the SPEAK platform, but it may be something we will revisit down the road.

Thanks again,  
David

**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Henry, Bonnie \[EXT\]](#)  
**Subject:** Re: overview of heat dome  
**Date:** Thursday, July 22, 2021 8:37:48 AM

---

Hi Bonnie,

No worries, these are busy times. Yes, I can do this at 1:30. The data still have not stabilized, but we are getting closer to a reasonable estimate of total excess mortality and it's coarse geographic distribution.

If we can do by zoom, I can show some numbers and charts. If not, I can try to prepare some slides to send in advance.

Cheers,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC  
Associate Professor (Partner) | School of Population & Public Health | UBC  
Sent from s.15(1)(i)

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On Jul 22, 2021, at 8:25 AM, Henry, Bonnie HLTH:EX wrote:

---

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Hi Sarah,

Sorry, I had a crazy day yesterday and didn't get a chance to call you. Do you have a few minutes after the heat expert meeting today to give the Deputy (Steve) a quick overview of the data on deaths from the heat dome? At 1:30? I have been trying to explain the difference between reports to the coroner and overall excess deaths but you can do it better.

Thanks!

Bonnie

*Dr Bonnie Henry  
Provincial Health Officer  
Office of the PHO  
Ministry of Health*

s.19(1)

s.19(1)



*I gratefully acknowledge that I live and work on the traditional unceded territory of the Lekwungen Peoples, specifically the Songhees and Esquimalt First Nations. Hay'sxw'qu Si'ems*

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**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Henry, Bonnie \[EXT\]](#)  
**Subject:** RE: Touchbase - Bonnie/Stephen/Sarah/Peter  
**Date:** Thursday, July 22, 2021 11:51:49 AM  
**Attachments:** [Excess mortality during the June 2021 heatwave in British Columbia.pdf](#)

---

Hi Bonnie –

Please see today's excess mortality report attached. I haven't included the Ministers here, but please feel free to forward if appropriate.

This isn't designed for a lay audience, it's just our internal tool for keeping track of things. Key points:

- Current excess mortality estimate from June 25-July 1 (7-day period) is ~590 deaths, which is up 15-20 from yesterday so the data are still coming in.
- The largest increases over baseline (last column of each table) were observed in Fraser Health (particularly Fraser North and Fraser South HSDAs) and Vancouver Coastal (Vancouver HSDA). All these HSDAs had increases of 100-150% over baseline.
- All age groups were affected, but increases over baseline were ~60-90% for all age groups over 50.
- 450 of the current excess death estimate occurred out of care (at home or in the community) based on 6-digit postal code of death.

Thanks,

Sarah

---

Sarah B. Henderson, PhD  
Scientific Director | Environmental Health Services | BCCDC  
Associate Professor (Partner) | School of Population and Public Health | UBC  
Office: 604.707.2449  
Cell: [s.15\(1\)\(i\)](#)  
[\*\*#DifferentTogether\*\*](#)  
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-----Original Appointment-----

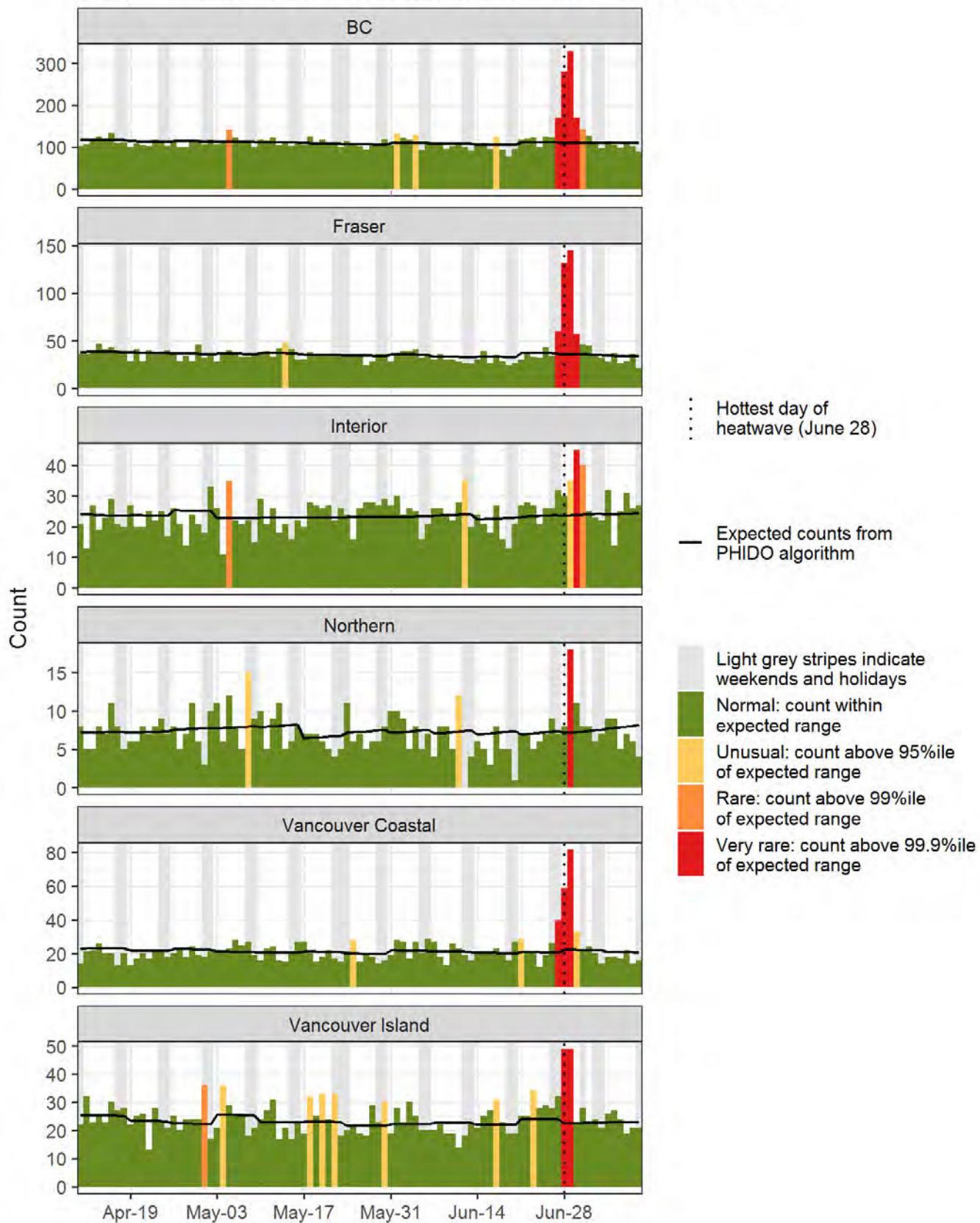
**From:** Henry, Bonnie HLTH:EX [s.19\(1\)](#)  
**Sent:** Thursday, July 22, 2021 9:42 AM  
**To:** Henry, Bonnie HLTH:EX; Stephen.Brown@gov.bc.ca [Ext]; Henderson, Sarah [BCCDC]; Pokorny, Peter HLTH:EX  
**Subject:** Touchbase - Bonnie/Stephen/Sarah/Peter  
**When:** Thursday, July 22, 2021 1:30 PM-2:00 PM (UTC-08:00) Pacific Time (US & Canada).  
**Where:** [s.15\(1\)\(i\)](#)

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# Excess mortality during the June 2021 heatwave in British Columbia

## Daily mortality in British Columbia and health authorities



**Table of excess mortality using daily data (PHIDO algorithm only)  
from June 25 2021 to July 2 2021**

Region	Observed deaths	Expected deaths	Excess deaths	% increase
British Columbia	1471	882	589	67
Interior Health Authority	259	190	69	36
Fraser Health Authority	563	289	274	95
Vancouver Coastal Health Authority	304	172	132	77
Vancouver Island Health Authority	261	185	76	41
Northern Health Authority	76	58	18	31
East Kootenay HSDA	26	18	8	44
Kootenay Boundary HSDA	23	19	4	21
Okanagan HSDA	129	96	33	34
Thompson Cariboo Shuswap HSDA	81	57	24	42
Fraser East HSDA	116	62	54	87
Fraser North HSDA	207	94	113	120
Fraser South HSDA	240	133	107	80
Richmond HSDA	32	25	7	28
Vancouver HSDA	200	98	102	104
North Shore/Coast Garibaldi HSDA	72	53	19	36
South Vancouver Island HSDA	117	78	39	50
Central Vancouver Island HSDA	106	80	26	32
North Vancouver Island HSDA	38	36	2	6
Northwest HSDA	22	17	5	29
Northern Interior HSDA	41	30	11	37
Northeast HSDA	13	11	2	18

## Table of excess mortality using weekly data for the week from June 25 2021 to July 1 2021

Region	Observed deaths	Expected deaths from PHIDO	Excess deaths from PHIDO	Expected deaths from Farrington	Excess deaths from Farrington	% increase
British Columbia	1345	757	588	751	594	78
Interior Health Authority	234	157	77	155	79	50
Fraser Health Authority	518	240	278	238	280	117
Vancouver Coastal Health Authority	280	143	137	152	128	90
Vancouver Island Health Authority	238	157	81	152	86	54
Northern Health Authority	68	51	17	47	21	39
East Kootenay HSDA	25	15	10	14	11	72
Kootenay Boundary HSDA	20	16	4	16	4	25
Okanagan HSDA	116	81	35	81	35	43
Thompson Cariboo Shuswap HSDA	73	50	23	44	29	55
Fraser East HSDA	102	54	48	54	48	89
Fraser North HSDA	194	79	115	76	118	150
Fraser South HSDA	222	108	114	109	113	105
Richmond HSDA	28	21	7	20	8	37

Region	Observed deaths	Expected deaths from PHIDO	Excess deaths from PHIDO	Expected deaths from Farrington	Excess deaths from Farrington	% increase
Vancouver HSDA	183	81	102	89	94	115
North Shore/Coast Garibaldi HSDA	69	44	25	43	26	59
South Vancouver Island HSDA	109	67	42	65	44	65
Central Vancouver Island HSDA	93	65	28	59	34	50
North Vancouver Island HSDA	36	28	8	28	8	29
Northwest HSDA	21	14	7	13	8	56
Northern Interior HSDA	35	27	8	26	9	32
Northeast HSDA	12	11	1	8	4	26

## Table of excess mortality by age group for the week from June 25 2021 to July 1 2021

Age group	Observed deaths	Expected deaths from PHIDO daily	Excess deaths from PHIDO daily	Expected deaths from PHIDO weekly	Excess deaths from PHIDO weekly	Expected deaths from Farrington	Excess deaths from Farrington	% increase
<50 years	82	73	9	70	12	69	13	18
50-64 years	171	114	57	106	65	104	67	63
65-74 years	250	143	107	140	110	133	117	83

Age group	Observed deaths	Expected deaths from PHIDO daily	Excess deaths from PHIDO daily	Expected deaths from PHIDO weekly	Excess deaths from PHIDO weekly	Expected deaths from Farrington	Excess deaths from Farrington	% increase
75-84 years	345	191	154	188	157	184	161	85
85+ year	497	273	224	256	241	261	236	92

## Table of excess mortality by setting of death for the week from June 25 2021 to July 1 2021

Setting of death	Observed deaths	Expected deaths from PHIDO daily	Excess deaths from PHIDO daily	Expected deaths from PHIDO weekly	Excess deaths from PHIDO weekly	Expected deaths from Farrington	Excess deaths from Farrington	% increase
Acute Care Facility	378	315	63	306	72	289	89	27
Community	729	276	453	273	456	278	451	165
Long term Care / Assisted Living Facility	238	194	44	185	53	189	49	27

**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Henry, Bonnie \[EXT\]](#)  
**Subject:** RE: Touchbase - Bonnie/Stephen/Sarah/Peter  
**Date:** Thursday, July 22, 2021 1:10:27 PM  
**Attachments:** [1\\_dispatches\\_total\\_2021-07-13.png](#)  
[2\\_dispatches\\_increased\\_2021-07-13.png](#)  
[3\\_dispatches\\_not\\_increased\\_2021-07-13.png](#)

---

I can't add it to that report, but here is the last EMS data we have.

We didn't update these this week yet.

Cheers,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: [s.15\(1\)\(l\)](#)

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**From:** Henry, Bonnie HLTH:EX [s.19\(1\)](#)

**Sent:** Thursday, July 22, 2021 1:08 PM

**To:** Henderson, Sarah [BCCDC]

**Subject:** RE: Touchbase - Bonnie/Stephen/Sarah/Peter

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---

Thanks, can you add the EMS call data as well. I know they are interested in how we are looking at the EMS calls

b

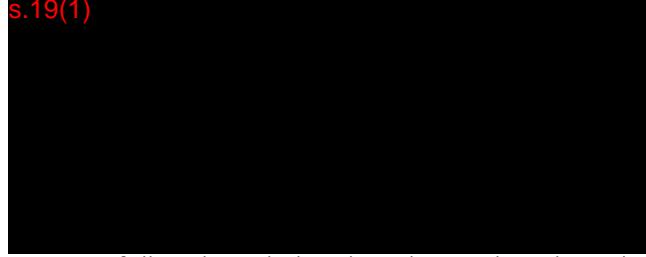
*Dr Bonnie Henry*

*Provincial Health Officer*

*Office of the PHO*

*Ministry of Health*

[s.19\(1\)](#)



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**From:** Henderson, Sarah [BCCDC]  
**Sent:** July 22, 2021 11:52 AM  
**To:** Henry, Bonnie HLTH:EX  
**Subject:** RE: Touchbase - Bonnie/Stephen/Sarah/Peter

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Hi Bonnie –

Please see today's excess mortality report attached. I haven't included the Ministers here, but please feel free to forward if appropriate.

This isn't designed for a lay audience, it's just our internal tool for keeping track of things. Key points:

- Current excess mortality estimate from June 25-July 1 (7-day period) is ~590 deaths, which is up 15-20 from yesterday so the data are still coming in.
- The largest increases over baseline (last column of each table) were observed in Fraser Health (particularly Fraser North and Fraser South HSDAs) and Vancouver Coastal (Vancouver HSDA). All these HSDAs had increases of 100-150% over baseline.
- All age groups were affected, but increases over baseline were ~60-90% for all age groups over 50.
- 450 of the current excess death estimate occurred out of care (at home or in the community) based on 6-digit postal code of death.

Thanks,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

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-----Original Appointment-----

**From:** Henry, Bonnie HLTH:EX s.19(1)

**Sent:** Thursday, July 22, 2021 9:42 AM

**To:** Henry, Bonnie HLTH:EX; [Stephen.Brown@gov.bc.ca](mailto:Stephen.Brown@gov.bc.ca) [Ext]; Henderson, Sarah [BCCDC]; Pokorny, Peter HLTH:EX

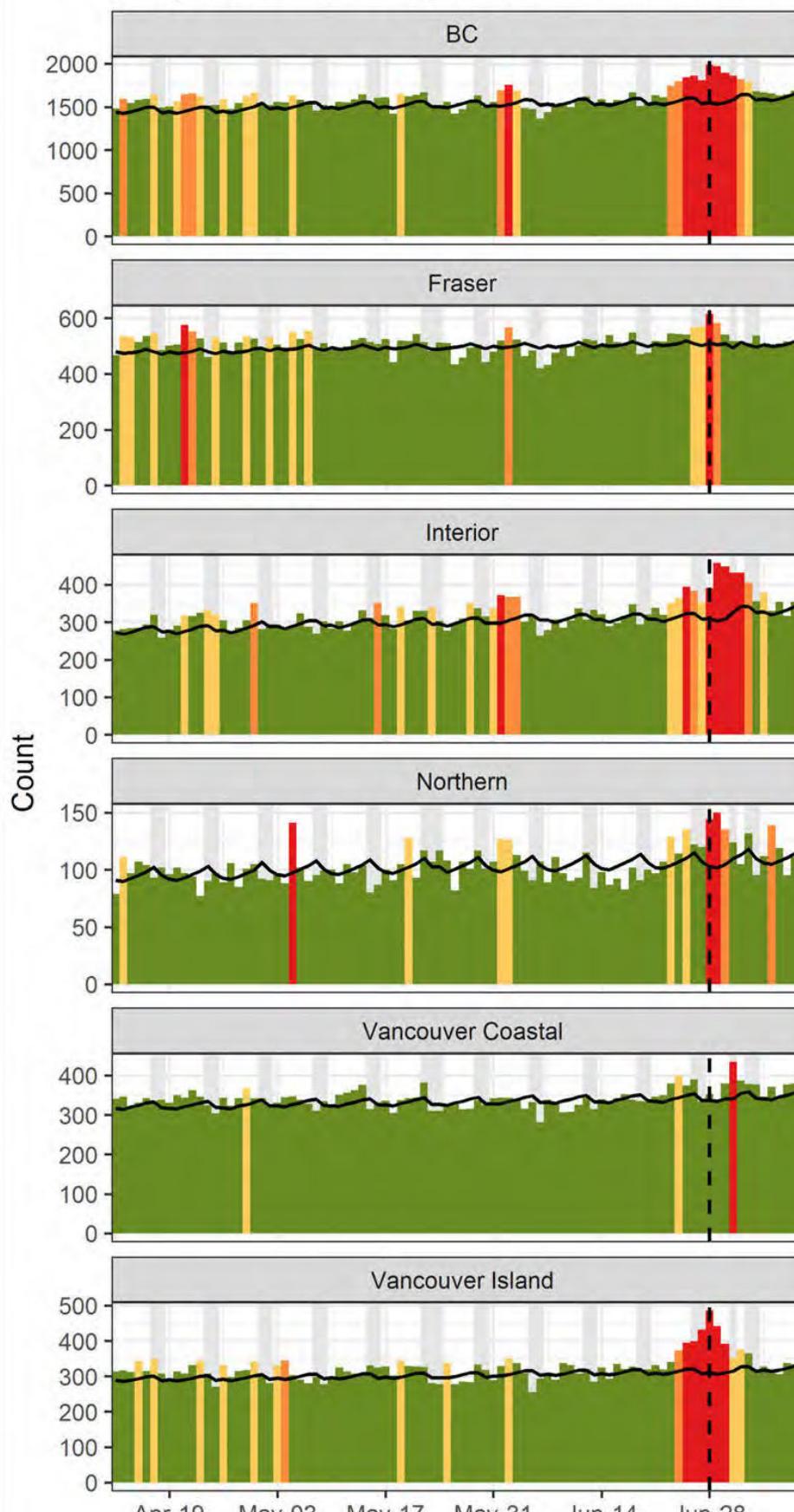
**Subject:** Touchbase - Bonnie/Stephen/Sarah/Peter

**When:** Thursday, July 22, 2021 1:30 PM-2:00 PM (UTC-08:00) Pacific Time (US & Canada).

**Where:** s.15(1)(i)

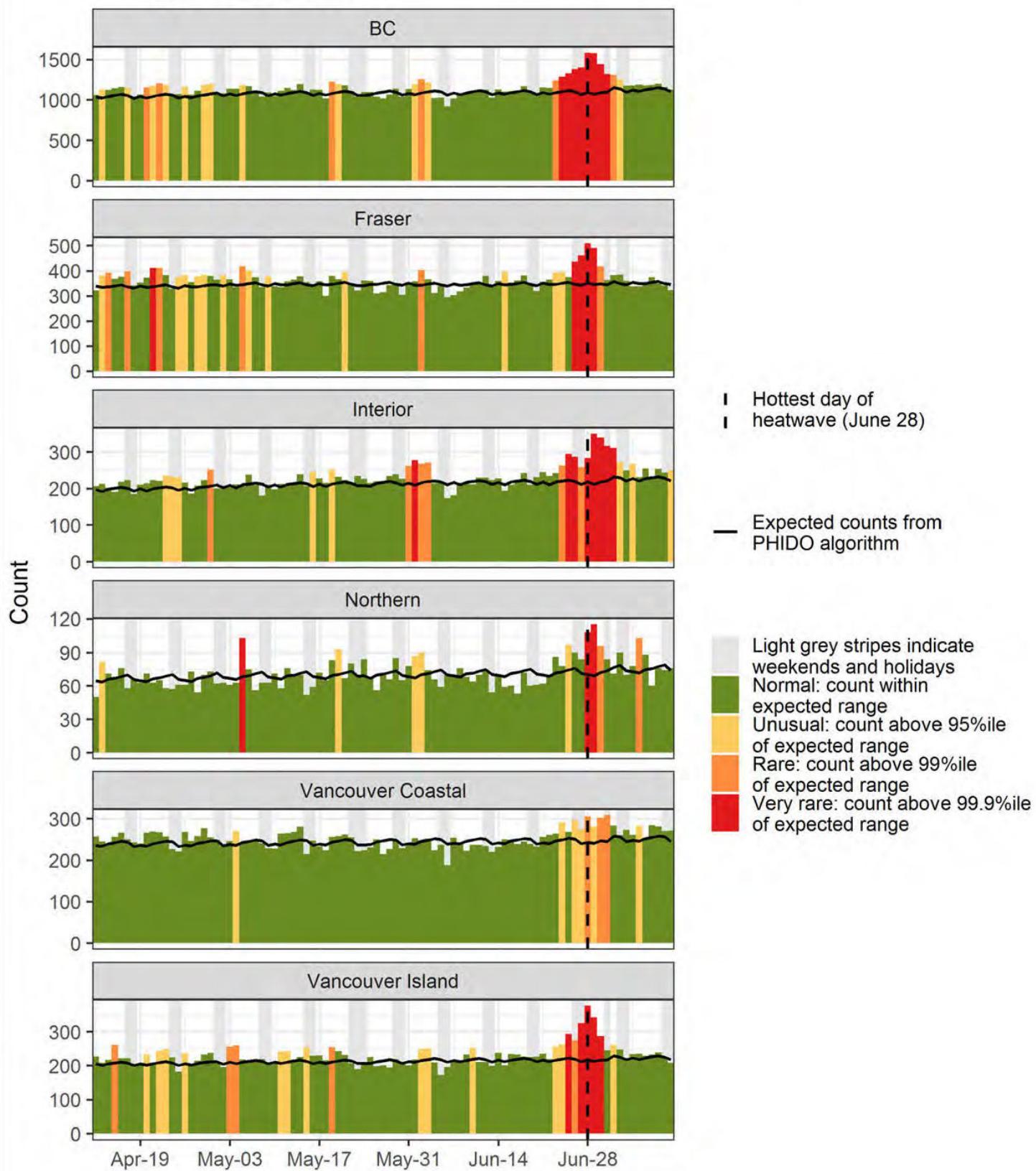
on links.

## Daily ambulance dispatches in British Columbia and health authorities



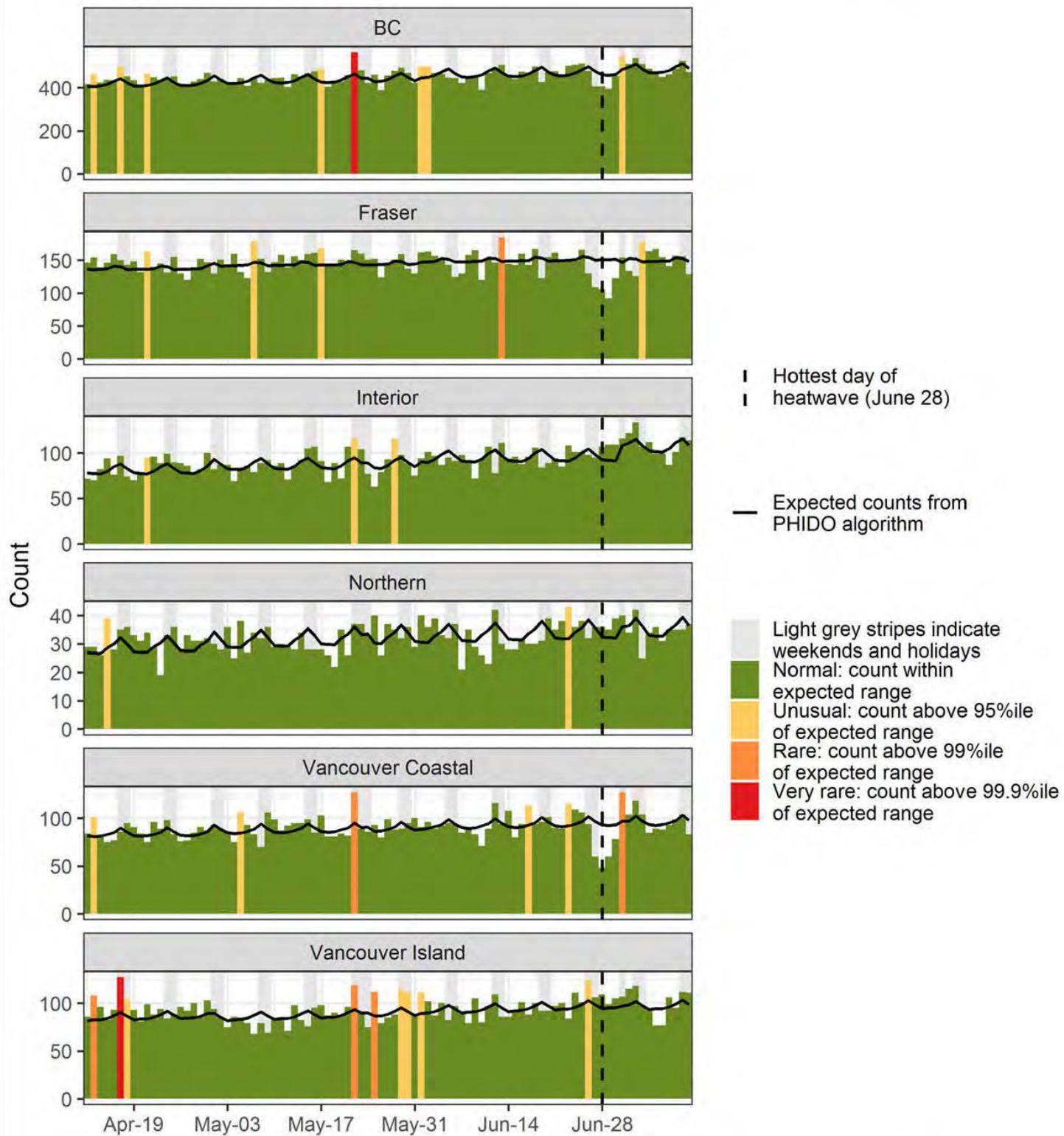
- | Hottest day of heatwave (June 28)
- Expected counts from PHIDO algorithm
- Light grey stripes indicate weekends and holidays
- Normal: count within expected range
- Unusual: count above 95%ile of expected range
- Rare: count above 99%ile of expected range
- Very rare: count above 99.9%ile of expected range

## Daily ambulance dispatches for codes that were increased during the heatwave\*



\* Dispatches for the following cards were increased: Breathing Problems; Cardiac or Respiratory Arrest / Death; Chest Pain (Non Traumatic); Falls; Heat / Cold Exposure; Overdose / Poisoning (Ingestion); Psychiatric / Abnormal Behavior / Suicide Attempt; Sick Person (specific diagnosis); Unconscious / Fainting (Near); Unknown Problem (man down); Transfer / Interfacility / Palliative Care

## Daily ambulance dispatches for codes that were not increased during the heatwave\*



\* Dispatches for the following cards were not increased: Abdominal Pain; Allergies (Reactions) / (Stings, Bites); Animal Bites / Attacks; Assault / Sexual Assault; Back Pain (Non-Traumatic or Non Recent Trauma); Burns (Scalds) / Explosions (Blasts); Carbon Monoxide / Inhalation / HAZMAT / CBRN; Choking; Convulsions / Seizures; Diabetic Problems; Drowning (Near) / Diving / SCUBA Accident; Electrocution / Lightning; Eye Problems / Injuries; Headache; Heart Problems / AICD; Hemorrhage / Lacerations; Inaccessible Incident / Other Entrapment (Non-Veh); Pregnancy / Childbirth / Miscarriage; Sfab / Gunshot / Penetrating Trauma; Stroke (CVA); Traffic / Transportation Incidents; Traumatic Injuries (Specific)

**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Henry, Bonnie \[EXT\]](#); [Gustafson, Reka \[BCCDC\]](#)  
**Subject:** Hot weather mortality update  
**Date:** Friday, July 23, 2021 4:20:18 PM  
**Attachments:** [2021-07-23\\_Excess mortality during the June 2021 heatwave in British Columbia.pdf](#)

---

Hi Bonnie, Reka –

We have started running daily reports on excess mortality during the extreme hot weather event, waiting for the data to stabilize before we make a final estimate. You can see today's report attached.

This isn't meant for the lay reader, it's meant for our own internal processes. We are running three different estimates:

- Sum of daily excess mortality over the one-week period using PHIDO
- Weekly excess mortality using PHIDO
- Weekly excess mortality using Farrington (the Stats Can model)

There is good agreement between all three, which is what we are looking for. The current estimate is 600, which has continued to go up all week. It was 520 on Monday, so the registrations are coming in very late.

Of these ~600 excess deaths, ~460 occurred in the community, ~90 occurred in acute care, and ~50 occurred in long-term care. Those numbers will shift around a bit, but I doubt the ratios will shift much. In essence, 75% of excess deaths occurred at home/out of care.

All age categories over 50 were significantly affected, but the magnitude of the impact increased with age.

The biggest impacts were in Fraser and Vancouver Coastal, and I can see from other sources of data that they were concentrated in Burnaby, New Westminster, and Vancouver regions. We will start some spatial cluster analysis next week for those who died out of care. I'm aiming to have a preliminary report finished within the next two weeks.

Thanks,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: [s.15\(1\)\(l\)](#)

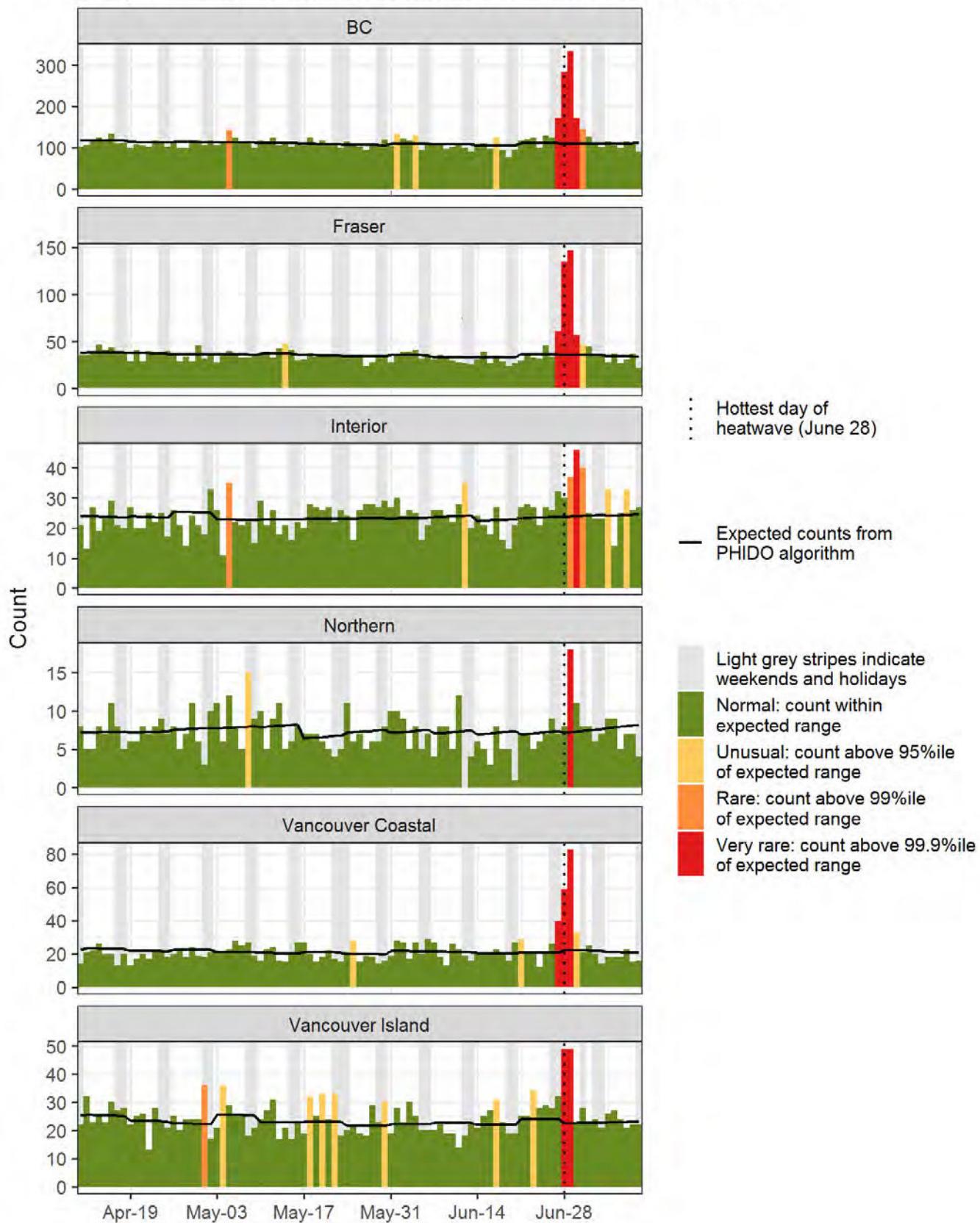
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# Excess mortality during the June 2021 heatwave in British Columbia

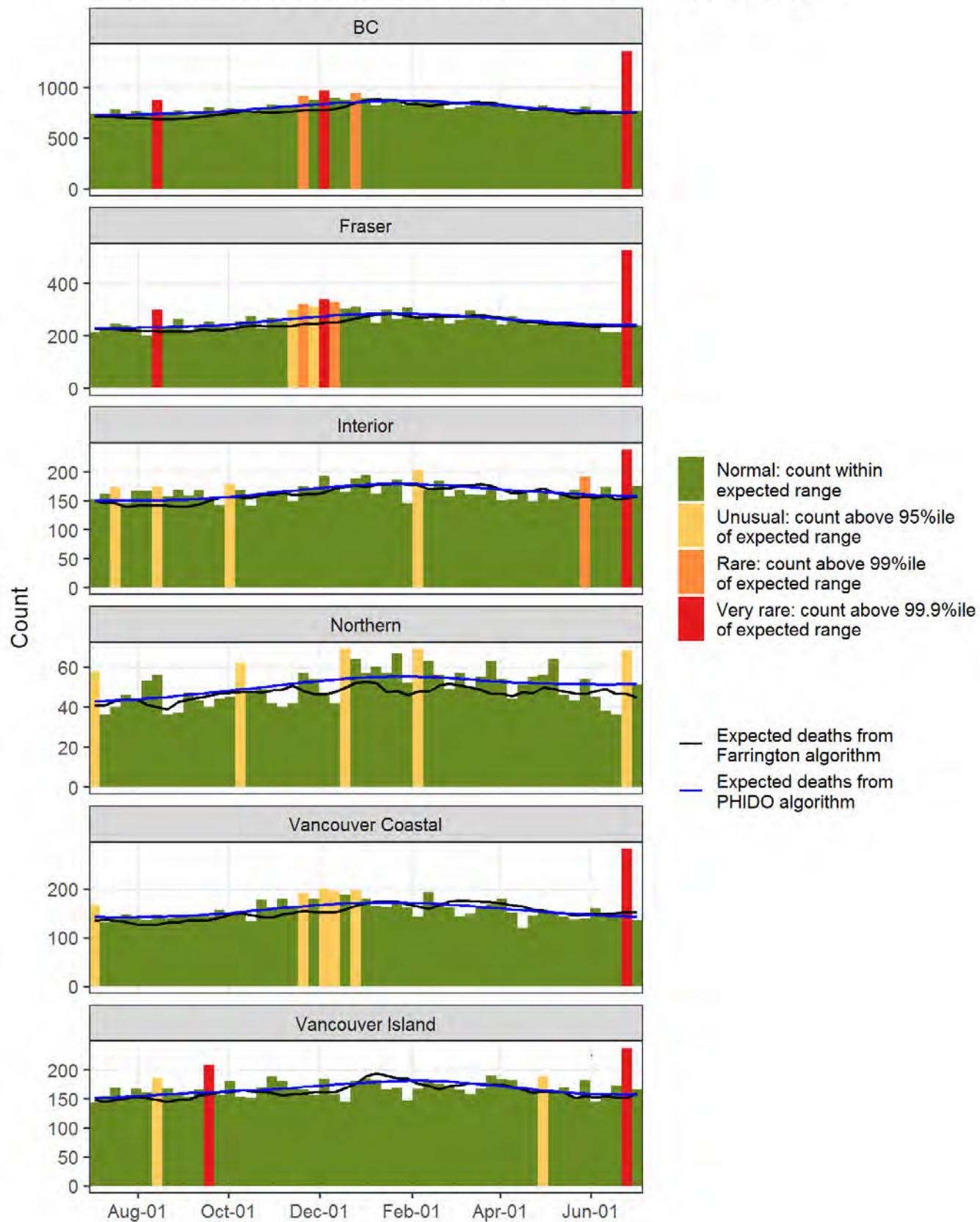
## Daily mortality in British Columbia and health authorities



**Table of excess mortality using daily data (PHIDO algorithm only)  
from June 25 2021 to July 2 2021**

Region	Observed deaths	Expected deaths	Excess deaths	% increase
British Columbia	1488	885	603	68
Interior Health Authority	263	191	72	38
Fraser Health Authority	572	288	284	99
Vancouver Coastal Health Authority	308	173	135	78
Vancouver Island Health Authority	261	185	76	41
Northern Health Authority	76	58	18	31
East Kootenay HSDA	27	18	9	50
Kootenay Boundary HSDA	23	19	4	21
Okanagan HSDA	130	96	34	35
Thompson Cariboo Shuswap HSDA	83	58	25	43
Fraser East HSDA	119	63	56	89
Fraser North HSDA	211	95	116	122
Fraser South HSDA	242	134	108	81
Richmond HSDA	32	25	7	28
Vancouver HSDA	202	98	104	106
North Shore/Coast Garibaldi HSDA	74	54	20	37
South Vancouver Island HSDA	117	78	39	50
Central Vancouver Island HSDA	106	80	26	32
North Vancouver Island HSDA	38	36	2	6
Northwest HSDA	22	17	5	29
Northern Interior HSDA	41	30	11	37
Northeast HSDA	13	11	2	18

## Weekly mortality in British Columbia and health authorities

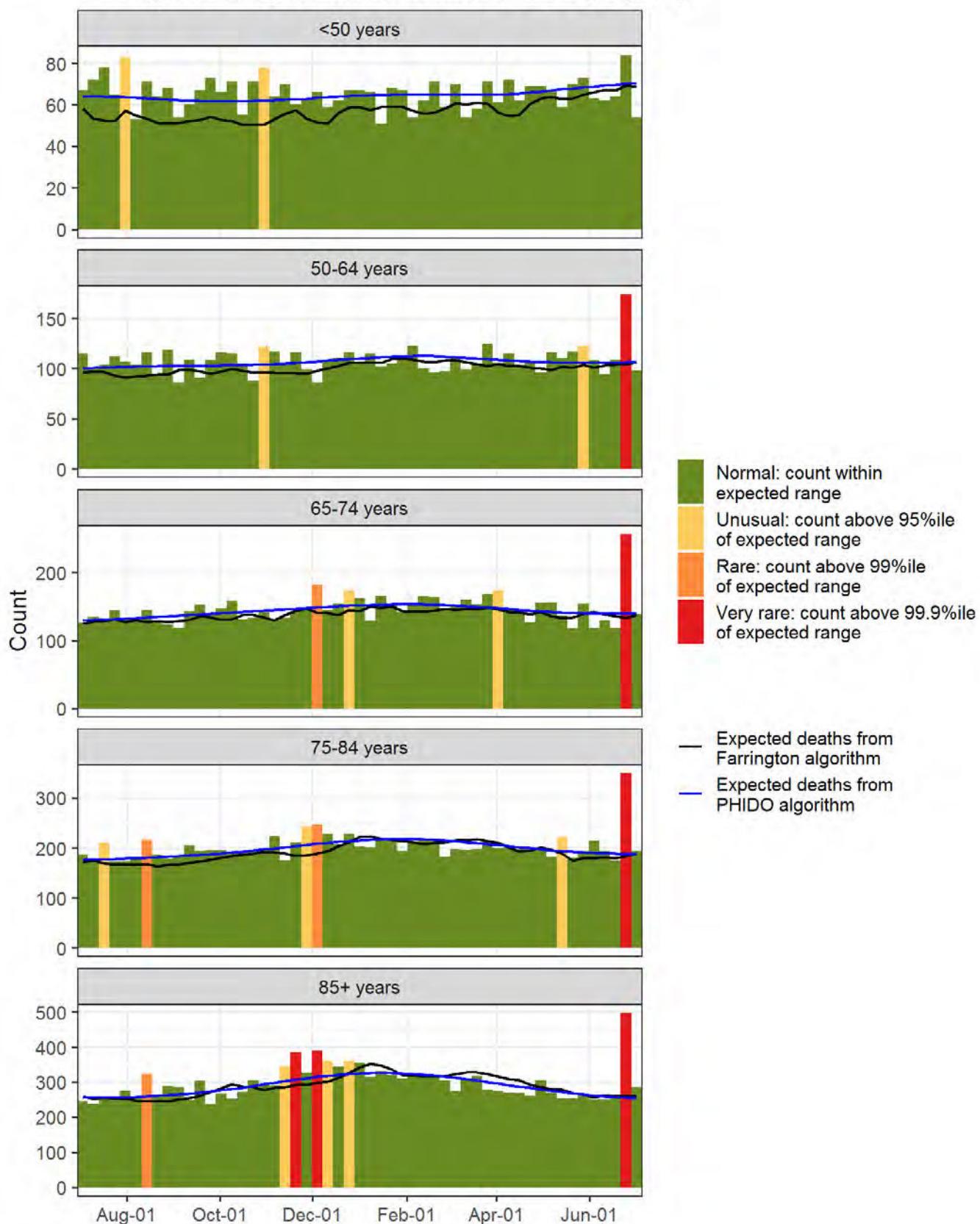


## Table of excess mortality using weekly data for the week from June 25 2021 to July 1 2021

Region	Observed deaths	Expected deaths from PHIDO	Excess deaths from PHIDO	Expected deaths from Farrington	Excess deaths from Farrington	% increase
British Columbia	1361	759	602	751	610	80
Interior Health Authority	238	158	80	155	83	52
Fraser Health Authority	527	241	286	238	289	120
Vancouver Coastal Health Authority	283	143	140	152	131	92
Vancouver Island Health Authority	238	157	81	152	86	54
Northern Health Authority	68	51	17	47	21	39
East Kootenay HSDA	26	15	11	14	12	79
Kootenay Boundary HSDA	20	16	4	16	4	25
Okanagan HSDA	117	79	38	81	36	46
Thompson Cariboo Shuswap HSDA	75	50	25	44	31	60
Fraser East HSDA	105	54	51	54	51	94
Fraser North HSDA	198	79	119	76	122	155
Fraser South HSDA	224	109	115	109	115	106
Richmond HSDA	28	21	7	20	8	37

Region	Observed deaths	Expected deaths from PHIDO	Excess deaths from PHIDO	Expected deaths from Farrington	Excess deaths from Farrington	% increase
Vancouver HSDA	185	81	104	89	96	118
North Shore/Coast Garibaldi HSDA	70	44	26	43	27	61
South Vancouver Island HSDA	109	67	42	65	44	65
Central Vancouver Island HSDA	93	66	27	59	34	49
North Vancouver Island HSDA	36	28	8	28	8	29
Northwest HSDA	21	14	7	13	8	56
Northern Interior HSDA	35	27	8	26	9	32
Northeast HSDA	12	11	1	8	4	26

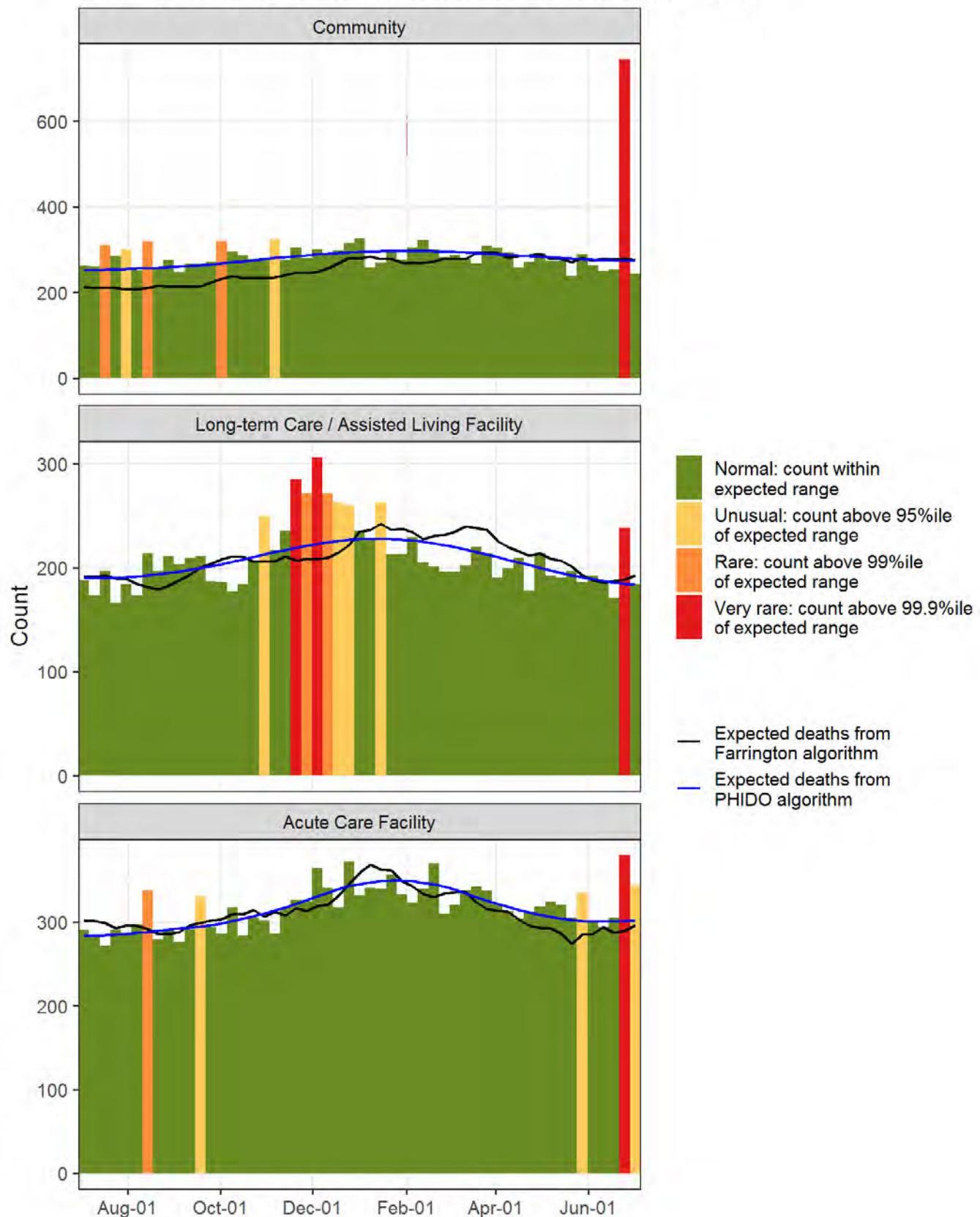
## Weekly mortality in British Columbia by age group



# Table of excess mortality by age group for the week from June 25 2021 to July 1 2021

Age group	Observed deaths	Expected deaths from PHIDO daily	Excess deaths from PHIDO daily	Expected deaths from PHIDO weekly	Excess deaths from PHIDO weekly	Expected deaths from Farrington	Excess deaths from Farrington	% increase
<50 years	84	74	10	70	14	69	15	21
50-64 years	174	112	62	106	68	104	70	66
65-74 years	257	144	113	140	117	133	124	88
75-84 years	349	192	157	188	161	184	165	88
85+ years	497	273	224	256	241	261	236	92

## Weekly mortality in British Columbia by setting of death



# Table of excess mortality by setting of death for the week from June 25 2021 to July 1 2021

Setting of death	Observed deaths	Expected deaths from PHIDO daily	Excess deaths from PHIDO daily	Expected deaths from PHIDO weekly	Excess deaths from PHIDO weekly	Expected deaths from Farrington	Excess deaths from Farrington	% increase
Acute Care Facility	380	316	64	301	79	289	91	29
Community	743	278	465	273	470	279	464	169
Long-term Care / Assisted Living Facility	238	194	44	185	53	189	49	27

**From:** Henry, Bonnie HLTH:EX [REDACTED]  
**Sent:** Tuesday, July 27, 2021 7:53 AM  
**To:** Henderson, Sarah [BCCDC]  
**Cc:** Pokorny, Peter HLTH:EX  
**Subject:** Re: Air Conditioning

EXTERNAL SENDER. If you suspect this message is malicious, please forward to spam@phsa.ca and do not open attachments or click on links.

Thanks Sarah, and thanks for the great work on helping us understand this.  
After 2 tomorrow would work for me as well.

B

Dr Bonnie Henry  
Provincial Health Officer  
Ministry of Health

s.19(1)

On Jul 27, 2021, at 7:25 AM, Henderson, Sarah [BCCDC] <Sarah.Henderson@bccdc.ca> wrote:

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Hi Peter –

I can prepare an update for tomorrow. Our estimates of excess mortality are stabilizing now, and we have mapped out all the deaths that occurred in the community (to the best of our knowledge, we do not have perfect information) to examine any spatial patterns. We have also used the COVID-19 cloud platform to ensure that current or prior infection was not a risk factor for mortality during the hot weather event (it was not).

The tricky thing will be timing, I am very inflexibly committed this week. I simply cannot do anything before noon, and anything between noon and 2 will take some shuffling on my part. After 2 is best, if possible.

I'm also extremely busy today, so won't have the opportunity to pull the deck together until this evening. I can forward a copy in the morning.

Thanks,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC Associate Professor (Partner) | School of Population and Public Health | UBC  
Office: 604.707.2449  
Cell: [REDACTED] s.15(1)(l)

#DifferentTogether<[https://engage.gov.bc.ca/app/uploads/sites/613/2020/11/In-Plain-Sight-Summary-Report.pdf](https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fltgov.bc.ca%2Fwp-content%2Fuploads%2F2020%2F05%2FPledge-v3.png&data=04%7C01%7C19(1)%7Cdbb9560060bb4f7907fe08d9510a5f0d%7C6fdb52003d0d4a8ab036d3685e359adc%7C0%7C0%7C637629927275954450%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzliLCJBtil6Ik1haWwiLCJVCI6Mn0%3D%7C1000&sdata=NkeHYnjdP6sttdieH8Mt8PiOOoBXu2f2QU2z6TC%2FB48%3D&reserved=0></a><br/>#InPlainSight<<a href=)>

From: "Pokorny, Peter HLTH:EX" <Peter.Pokorny@gov.bc.ca>

Date: Tuesday, July 27, 2021 at 7:16 AM

To: "Henderson, Sarah [BCCDC]" <Sarah.Henderson@bccdc.ca>, Bonnie Henry [REDACTED] s.19(1)

Subject: RE: Air Conditioning

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---

Hi Sarah – looking to set up a briefing with the Minister tomorrow (Weds) to walk through the data you presented to Steve and I last week. The approach would be to present “phase 1” of the analysis (essentially the materials you presented to us) and advise Minister that the next phase (linking data sets with other health service areas including BCEHS, updating based on info received from coroner, etc.) will take a few weeks.

Would you be able to prepare a brief deck similar to what you did last week (anything new?) and present tomorrow? If so, I'll get something arranged.

Thanks,  
Peter

Peter Pokorny  
Associate Deputy Minister  
Corporate Services  
Ministry of Health  
(778) 698-8046

From: Henderson, Sarah [BCCDC] <Sarah.Henderson@bccdc.ca>

Sent: July 22, 2021 3:31 PM

To: Pokorny, Peter HLTH:EX <Peter.Pokorny@gov.bc.ca>; Henry, Bonnie HLTH:EX [REDACTED] s.19(1); Brown, Stephen R HLTH:EX <Stephen.Brown@gov.bc.ca>  
Subject: RE: Air Conditioning

[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Thank you for this.

After our call I did scan through the data facility by facility and was only able to identify two specific LTCFs where there seemed to be an obvious impact of the hot weather – one in Fraser and one in Interior.

We will connect with the HAs to see whether we can get the facility-specific information on AC, which will allow us to stratify the provincial analyses by AC status. That will be more illuminating.

Cheers,

Sarah

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC Associate Professor (Partner) | School of Population and Public Health | UBC  
Office: 604.707.2449  
Cell [REDACTED] s.19(1)

#DifferentTogether<[https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fltgov.bc.ca%2Fwp-content%2Fuploads%2F2020%2F05%2FPledge-v3.png&data=04%7C01%20s.19\(1\)%20](https://can01.safelinks.protection.outlook.com/?url=https%3A%2F%2Fltgov.bc.ca%2Fwp-content%2Fuploads%2F2020%2F05%2FPledge-v3.png&data=04%7C01%20s.19(1)%20)>  
Cdbb9560060bb4f7907fe08d9510a5f0d%7C6fdb52003d0d4a8ab036d3685e359adc%7C0%7C0%7C637629927275964438%7CUnknown%7CTWFpbGZsb3d8eyJWljojMC4wLjAwMDAiLCJQljojV2luMzIiLCJBtil6Ik1haWwiLCJXVCi6Mn0%3D%7C1000&sdata=1fr%2FKg3vNlteDDqo%2Bxnk0jKGGZIKB1XP5EJ3F9I%2FoJY%3D&reserved=0>  
#!InPlainSight<<https://engage.gov.bc.ca/app/uploads/sites/613/2020/11/In-Plain-Sight-Full-Report.pdf>>  
PHSAhome1.phsabc.ehcnet.ca/SHenderson7/Add-in%20Express>

I often work outside of normal business hours because it suits me. There is no expectation that you will respond outside of your working hours.

From: Pokorny, Peter HLTH:EX [mailto:[Peter.Pokorny@gov.bc.ca](mailto:Peter.Pokorny@gov.bc.ca)]

Sent: Thursday, July 22, 2021 3:27 PM

To: Henry, Bonnie [EXT]; Stephen.Brown@gov.bc.ca<mailto:Stephen.Brown@gov.bc.ca> [Ext]; Henderson, Sarah [BCCDC]

## Subject: Air Conditioning

EXTERNAL SENDER. If you suspect this message is malicious, please forward to [spam@phsa.ca](mailto:spam@phsa.ca)<mailto:spam@phsa.ca> and do not open attachments or click on links.

Hi Sarah – as discussed earlier today, this is the summary information I was provided on air conditioning in LTC/AL facilities. Obviously not helpful in terms of establishing direct linkages, but just to show that health authorities will have much of the information you'll need based on the calls they've made to individual facilities.

## Long Term Care and Assisted Living Air Conditioning Availability Health Authority

## Full Air Conditioning

## Partial Air Conditioning[1]

## No Air Conditioning

Unknown[2]

**From:** Schwandt, Michael [VCH]  
**To:** Henderson, Sarah [BCCDC]; Blessin, Scott [PHSA]; Lancaster, Deana [VCH]; Newhouse, Emily [FH]; Lubik, Amy [FH]; McVea, David [BCCDC]; Ash, Randy [VCH]; Kosatsky, Tom [BCCDC]; "Sekhon,Baljit (ECCC)"; Spence, Nicole [PHSA]  
**Cc:** Peterson, Emily [VCH]  
**Subject:** RE: HARS algorithm & Special Weather Statement  
**Date:** Tuesday, July 27, 2021 11:42:29 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)

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Hi everyone,

s.13(1)



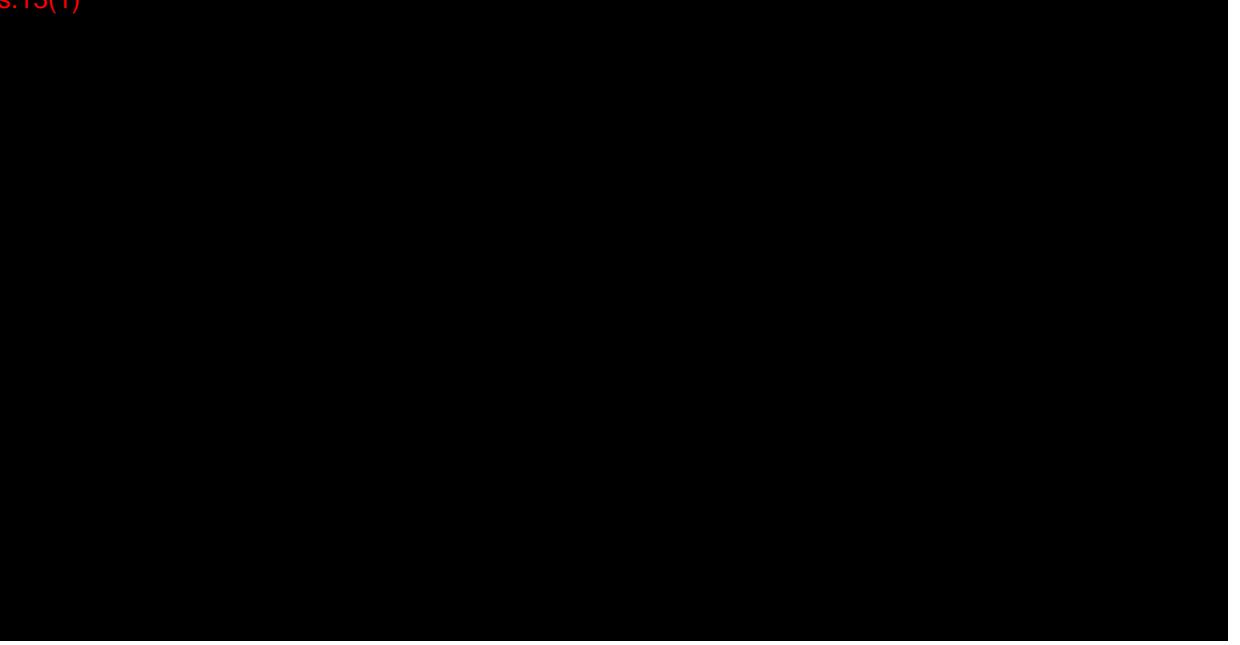
Michael

**From:** Henderson, Sarah [BCCDC]  
**Sent:** Tuesday, July 27, 2021 9:29 AM  
**To:** Blessin, Scott [PHSA] ; Lancaster, Deana [VCH] ; Schwandt, Michael [VCH] ; Newhouse, Emily [FH] ; Lubik, Amy [FH] ; McVea, David [BCCDC] ; Ash, Randy [VCH] ; Kosatsky, Tom [BCCDC] ; 'Sekhon,Baljit (ECCC)' ; Spence, Nicole [PHSA]  
**Cc:** Peterson, Emily [VCH]  
**Subject:** RE: HARS algorithm & Special Weather Statement

Hi all –

Apologies for missing the call yesterday, it just didn't seem like the most efficient use of time to have all of Tom, David, and me there.

s.13(1)



Cheers,

Sarah

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: **s.15(1)(l)**

**#DifferentTogether**

**#InPlainSight**

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---

**From:** Blessin, Scott [PHSA]

**Sent:** Monday, July 26, 2021 11:38 PM

**To:** Lancaster, Deana [VCH]; Henderson, Sarah [BCCDC]; Schwandt, Michael [VCH]; Newhouse, Emily [FH]; Lubik, Amy [FH]; McVea, David [BCCDC]; Ash, Randy [VCH]; Kosatsky, Tom [BCCDC]; 'Sekhon,Baljit (ECCC)'; Spence, Nicole [PHSA]

**Cc:** Peterson, Emily [VCH]

**Subject:** HARS algorithm & Special Weather Statement

Good evening,

I have updated a version of the internal algorithm to reflect simplification of the Heat Alert criteria. Please advise if there are any concerns/comments. The external version will be similarly updated tomorrow.

Also for those who may not be signed up for the Alert Me app from ECCC a special weather statement was issued for East Vancouver Island, Sunshine Coast, Whistler, Howe Sound, Metro Vancouver and Fraser Valley today at 5:26pm. See attachment for details.

Scott.

**Scott Blessin**

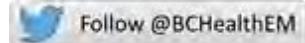
Manager, HEMBC Fraser Health

Health Emergency Management British Columbia (HEMBC)

Mobile: **s.15(1)(l)**

Email: [Scott.Blessin@phsa.ca](mailto:Scott.Blessin@phsa.ca)

**After hours HEMBC LM On-Call 1-855-675-2436**

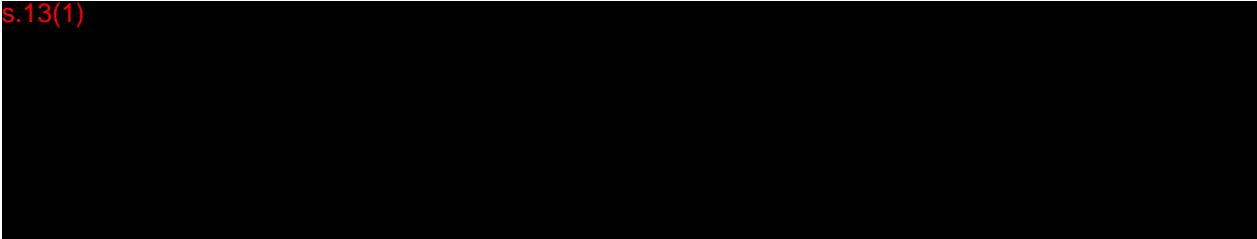


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**From:** Schwandt, Michael [VCH]  
**To:** Henderson, Sarah [BCCDC] ; "Sekhon,Baljit (ECCC)" ; Lancaster, Deana [VCH] ; Blessin, Scott [PHSA] ; Newhouse, Emily [FH] ; Lubik, Amy [FH] ; McVea, David [BCCDC] ; Ash, Randy [VCH] ; Kosatsky, Tom [BCCDC] ; Spence, Nicole [PHSA]  
**Cc:** Peterson, Emily [VCH]  
**Subject:** RE: HARS algorithm & Special Weather Statement  
**Date:** Tuesday, July 27, 2021 11:47:43 AM  
**Attachments:** [image001.png](#)  
[image002.png](#)

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s.13(1)



Michael

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**From:** Henderson, Sarah [BCCDC]  
**Sent:** Tuesday, July 27, 2021 10:33 AM  
**To:** 'Sekhon,Baljit (ECCC)' ; Lancaster, Deana [VCH] ; Blessin, Scott [PHSA] ; Schwandt, Michael [VCH] ; Newhouse, Emily [FH] ; Lubik, Amy [FH] ; McVea, David [BCCDC] ; Ash, Randy [VCH] ; Kosatsky, Tom [BCCDC] ; Spence, Nicole [PHSA]  
**Cc:** Peterson, Emily [VCH]  
**Subject:** RE: HARS algorithm & Special Weather Statement

Hi all –

I would really like to see something related to hot indoor temperatures overnight. I'm not sure what the exact messaging should be, but something along the lines of:

Indoor temperatures may not decrease much overnight, even with the windows and doors open to let in cool air. High indoor temperatures can be dangerous for older adults and those with chronic conditions. If indoor overnight temperatures are high, consider relocation to a cooler environment. Otherwise, sleep in the coolest area of the house or outside if possible.

Keep water by your bedside to drink through the night.

Needs some work, but I think it is worth saying these things.

Cheers,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: [s.15\(1\)\(l\)](#)

**#DifferentTogether**

**#InPlainSight**

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---

**From:** Sekhon,Baljit (ECCC) [<mailto:Baljit.Sekhon@ec.gc.ca>]  
**Sent:** Tuesday, July 27, 2021 9:56 AM  
**To:** Lancaster, Deana [VCH]; Henderson, Sarah [BCCDC]; Blessin, Scott [PHSA]; Schwandt, Michael [VCH]; Newhouse, Emily [FH]; Lubik, Amy [FH]; McVea, David [BCCDC]; Ash, Randy [VCH]; Kosatsky, Tom [BCCDC]; Spence, Nicole [PHSA]  
**Cc:** Peterson, Emily [VCH]  
**Subject:** RE: HARS algorithm & Special Weather Statement  
**EXTERNAL SENDER.** If you suspect this message is malicious, please forward to [spam@phsa.ca](mailto:spam@phsa.ca) and **do not** open attachments or click on links.

If you're issuing the news release tomorrow, maybe just touch base with me beforehand in case we are planning to upgrade to Heat Warnings (from the Special Weather Statement).

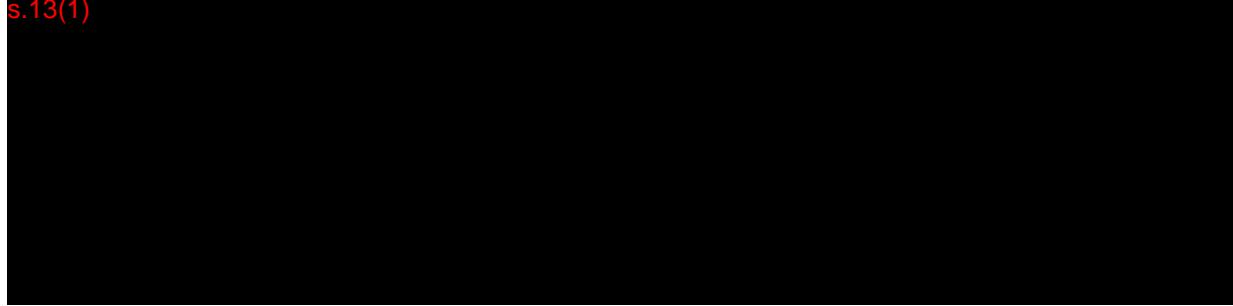
Also, I will be on live with CKNW at 10:17 am talking about heat. Anything you would like me to mention about city facilities to stay cool? Encourage people to visit rec centres and libraries (places with a/c) if they feel they need to cool down? My usual safety messaging usually comes from <https://www.canada.ca/en/health-canada/services/sun-safety/extreme-heat-heat-waves.html>.

Bobby

**From:** Lancaster, Deana [VCH] <[deana.lancaster@vch.ca](mailto:deana.lancaster@vch.ca)>  
**Sent:** July 27, 2021 9:49 AM  
**To:** Henderson, Sarah [BCCDC] <[sarah.henderson@bccdc.ca](mailto:sarah.henderson@bccdc.ca)>; Blessin, Scott [PHSA] <[Scott.Blessin@phsa.ca](mailto:Scott.Blessin@phsa.ca)>; Schwandt, Michael [VCH] <[michael.schwandt@vch.ca](mailto:michael.schwandt@vch.ca)>; Newhouse, Emily [FH] <[Emily.Newhouse@fraserhealth.ca](mailto:Emily.Newhouse@fraserhealth.ca)>; Lubik, Amy [FH] <[amy.lubik@fraserhealth.ca](mailto:amy.lubik@fraserhealth.ca)>; McVea, David [BCCDC] <[David.McVea@bccdc.ca](mailto:David.McVea@bccdc.ca)>; Ash, Randy [VCH] <[Randy.Ash@vch.ca](mailto:Randy.Ash@vch.ca)>; Kosatsky, Tom [BCCDC] <[Tom.Kosatsky@bccdc.ca](mailto:Tom.Kosatsky@bccdc.ca)>; Sekhon,Baljit (ECCC) <[Baljit.Sekhon@ec.gc.ca](mailto:Baljit.Sekhon@ec.gc.ca)>; Spence, Nicole [PHSA] <[nicole.spence@phsa.ca](mailto:nicole.spence@phsa.ca)>  
**Cc:** Peterson, Emily [VCH] <[emily.peterson@vch.ca](mailto:emily.peterson@vch.ca)>  
**Subject:** RE: HARS algorithm & Special Weather Statement

Thanks Sarah,

s.13(1)



**Deana Lancaster**

Communications Leader, Public Health

**Vancouver Coastal Health**

work 604 230 6130

e-mail [deana.lancaster@vch.ca](mailto:deana.lancaster@vch.ca)

I acknowledge that my place of work lies on the unceded traditional homelands of the Musqueam, Squamish and Tsleil-Waututh Nations.

The content of this e-mail is confidential and may be privileged. If you receive this e-mail in error, please contact the sender and delete it immediately.

**From:** Henderson, Sarah [BCCDC] <[Sarah.Henderson@bccdc.ca](mailto:Sarah.Henderson@bccdc.ca)>  
**Sent:** Tuesday, July 27, 2021 9:29 AM  
**To:** Blessin, Scott [PHSA] <[Scott.Blessin@phsa.ca](mailto:Scott.Blessin@phsa.ca)>; Lancaster, Deana [VCH] <[deana.lancaster@vch.ca](mailto:deana.lancaster@vch.ca)>; Schwandt, Michael [VCH] <[michael.schwandt@vch.ca](mailto:michael.schwandt@vch.ca)>; Newhouse, Emily [FH] <[Emily.Newhouse@fraserhealth.ca](mailto:Emily.Newhouse@fraserhealth.ca)>; Lubik, Amy [FH] <[amy.lubik@fraserhealth.ca](mailto:amy.lubik@fraserhealth.ca)>;

McVea, David [BCCDC] <[David.McVea@bccdc.ca](mailto:David.McVea@bccdc.ca)>; Ash, Randy [VCH] <[Randy.Ash@vch.ca](mailto:Randy.Ash@vch.ca)>; Kosatsky, Tom [BCCDC] <[Tom.Kosatsky@bccdc.ca](mailto:Tom.Kosatsky@bccdc.ca)>; 'Sekhon,Baljit (ECCC)' <[Baljit.Sekhon@ec.gc.ca](mailto:Baljit.Sekhon@ec.gc.ca)>; Spence, Nicole [PHSA] <[nicole.spence@phsa.ca](mailto:nicole.spence@phsa.ca)>

**Cc:** Peterson, Emily [VCH] <[emily.peterson@vch.ca](mailto:emily.peterson@vch.ca)>

**Subject:** RE: HARS algorithm & Special Weather Statement

Hi all –

Apologies for missing the call yesterday, it just didn't seem like the most efficient use of time to have all of Tom, David, and me there.

s.13(1)



Cheers,  
Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: s.15(1)(l)

**#DifferentTogether**

**#InPlainSight**

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**From:** Blessin, Scott [PHSA]

**Sent:** Monday, July 26, 2021 11:38 PM

**To:** Lancaster, Deana [VCH]; Henderson, Sarah [BCCDC]; Schwandt, Michael [VCH]; Newhouse, Emily [FH]; Lubik, Amy [FH]; McVea, David [BCCDC]; Ash, Randy [VCH]; Kosatsky, Tom [BCCDC]; 'Sekhon,Baljit (ECCC)'; Spence, Nicole [PHSA]

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**Subject:** HARS algorithm & Special Weather Statement

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Scott.

**Scott Blessin**

Manager, HEMBC Fraser Health

Health Emergency Management British Columbia (HEMBC)

Mobile: **s.15(1)(l)**

Email: [Scott.Blessin@phsa.ca](mailto:Scott.Blessin@phsa.ca)

**After hours HEMBC LM On-Call 1-855-675-2436**



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**From:** [Henderson, Sarah \[BCCDC\]](#)  
**To:** [Pokorny, Peter HLTH:EX](#); [Henry, Bonnie \[EXT\]](#)  
**Subject:** Re: Air Conditioning  
**Date:** Tuesday, July 27, 2021 9:27:06 PM  
**Attachments:** [Ministry Brief - July 28 2021.pdf](#)

---

Hi folks –

Please find the slide deck attached for tomorrow.

Cheers,

Sarah

---

Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: [s.15\(1\)\(i\)](#)

**#DifferentTogether**

**#InPlainSight**

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---

**From:** "Pokorny, Peter HLTH:EX"

**Date:** Tuesday, July 27, 2021 at 12:06 PM

**To:** "Henderson, Sarah [BCCDC]", Bonnie Henry

**Subject:** RE: Air Conditioning

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---

Thanks for this, Sarah. A deck in the morning is fine...still working to find time tomorrow afternoon.

Peter

---

**From:** Henderson, Sarah [BCCDC]

**Sent:** July 27, 2021 7:25 AM

**To:** Pokorny, Peter HLTH:EX ; Henry, Bonnie HLTH:EX

**Subject:** Re: Air Conditioning

**[EXTERNAL] This email came from an external source. Only open attachments or links that you are expecting from a known sender.**

Hi Peter –

I can prepare an update for tomorrow. Our estimates of excess mortality are stabilizing now, and we have mapped out all the deaths that occurred in the community (to the best of our knowledge, we do not have perfect information) to examine any spatial patterns. We have also used the COVID-19 cloud platform to ensure that current or prior infection was not a risk factor for mortality during the hot weather event (it was not).

The tricky thing will be timing, I am very inflexibly committed this week. I simply cannot do anything before noon, and anything between noon and 2 will take some shuffling on my part. After 2 is best, if possible.

I'm also extremely busy today, so won't have the opportunity to pull the deck together until this evening. I can forward a copy in the morning.

Thanks,

Sarah

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Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: s.15(1)(l)

**#DifferentTogether**

**#InPlainSight**

---

**From:** "Pokorny, Peter HLTH:EX" <[Peter.Pokorny@gov.bc.ca](mailto:Peter.Pokorny@gov.bc.ca)>

**Date:** Tuesday, July 27, 2021 at 7:16 AM

**To:** "Henderson, Sarah [BCCDC]" <[Sarah.Henderson@bccdc.ca](mailto:Sarah.Henderson@bccdc.ca)>, Bonnie Henry

s.19(1)

**Subject:** RE: Air Conditioning

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Hi Sarah – looking to set up a briefing with the Minister tomorrow (Weds) to walk through the data you presented to Steve and I last week. The approach would be to present “phase 1” of the analysis (essentially the materials you presented to us) and advise Minister that the next phase (linking data sets with other health service areas including BCEHS, updating based on info received from coroner, etc.) will take a few weeks.

Would you be able to prepare a brief deck similar to what you did last week (anything new?) and present tomorrow? If so, I'll get something arranged.

Thanks,

Peter

Peter Pokorny

Associate Deputy Minister

Corporate Services

Ministry of Health

(778) 698-8046

---

**From:** Henderson, Sarah [BCCDC] <[Sarah.Henderson@bccdc.ca](mailto:Sarah.Henderson@bccdc.ca)>

**Sent:** July 22, 2021 3:31 PM

**To:** Pokorny, Peter HLTH:EX <[Peter.Pokorny@gov.bc.ca](mailto:Peter.Pokorny@gov.bc.ca)>; Henry, Bonnie HLTH:EX

s.19(1) Brown, Stephen R HLTH:EX <[Stephen.Brown@gov.bc.ca](mailto:Stephen.Brown@gov.bc.ca)>

**Subject:** RE: Air Conditioning

**[EXTERNAL]** This email came from an external source. Only open attachments or links that you are expecting from a known sender.

Thank you for this.

After our call I did scan through the data facility by facility and was only able to identify two

specific LTCFs where there seemed to be an obvious impact of the hot weather – one in Fraser and one in Interior.

We will connect with the HAs to see whether we can get the facility-specific information on AC, which will allow us to stratify the provincial analyses by AC status. That will be more illuminating.

Cheers,

Sarah

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Sarah B. Henderson, PhD

Scientific Director | Environmental Health Services | BCCDC

Associate Professor (Partner) | School of Population and Public Health | UBC

Office: 604.707.2449

Cell: **s.15(1)(l)**

**#DifferentTogether**

**#InPlainSight**

I often work outside of normal business hours because it suits me. There is no expectation that you will respond outside of your working hours.

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**From:** Pokorny, Peter HLTH:EX [<mailto:Peter.Pokorny@gov.bc.ca>]

**Sent:** Thursday, July 22, 2021 3:27 PM

**To:** Henry, Bonnie [EXT]; [Stephen.Brown@gov.bc.ca](mailto:Stephen.Brown@gov.bc.ca) [Ext]; Henderson, Sarah [BCCDC]

**Subject:** Air Conditioning

**EXTERNAL SENDER.** If you suspect this message is malicious, please forward to [spam@phsa.ca](mailto:spam@phsa.ca) and **do not** open attachments or click on links.

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Hi Sarah – as discussed earlier today, this is the summary information I was provided on air conditioning in LTC/AL facilities. Obviously not helpful in terms of establishing direct linkages, but just to show that health authorities will have much of the information you'll need based on the calls they've made to individual facilities.

### **Long Term Care and Assisted Living Air Conditioning Availability**

<b>Health Authority</b>	<b>Full Air Conditioning</b>	<b>Partial Air Conditioning</b> <sup>[1]</sup>	<b>No Air Conditioning</b>	<b>Unknown</b> <sup>[2]</sup>	<b>Cooling Equipment</b> <sup>[3]</sup>
FHA	32	55	15	12	17
IHA	29	1	12	n/a	n/a
NHA	13	6	8	n/a	2
VCH	13	31	11	39	4
VIHA	9	15	8	7	3

<sup>[1]</sup> Partial Air Conditioning includes facilities that classified having air conditioning in common areas only, cooling zones, or "not fully functional" air conditioning units.

<sup>[1]</sup> "Unknown" is for sites that did not report air conditioning information.

<sup>[1]</sup> Cooling equipment includes fans and small portable cooling equipment.

Thanks,

Peter

Peter Pokorny

Associate Deputy Minister

Corporate Services

Ministry of Health

(778) 698-8046

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[1] Partial Air Conditioning includes facilities that classified having air conditioning in common areas only, cooling zones, or "not fully functional" air conditioning units.

[2] "Unknown" is for sites that did not report air conditioning information.

[3] Cooling equipment includes fans and small portable cooling equipment.

# BCCDC Update on the 2021 Extreme Hot Weather Event

**July 28, 2021**



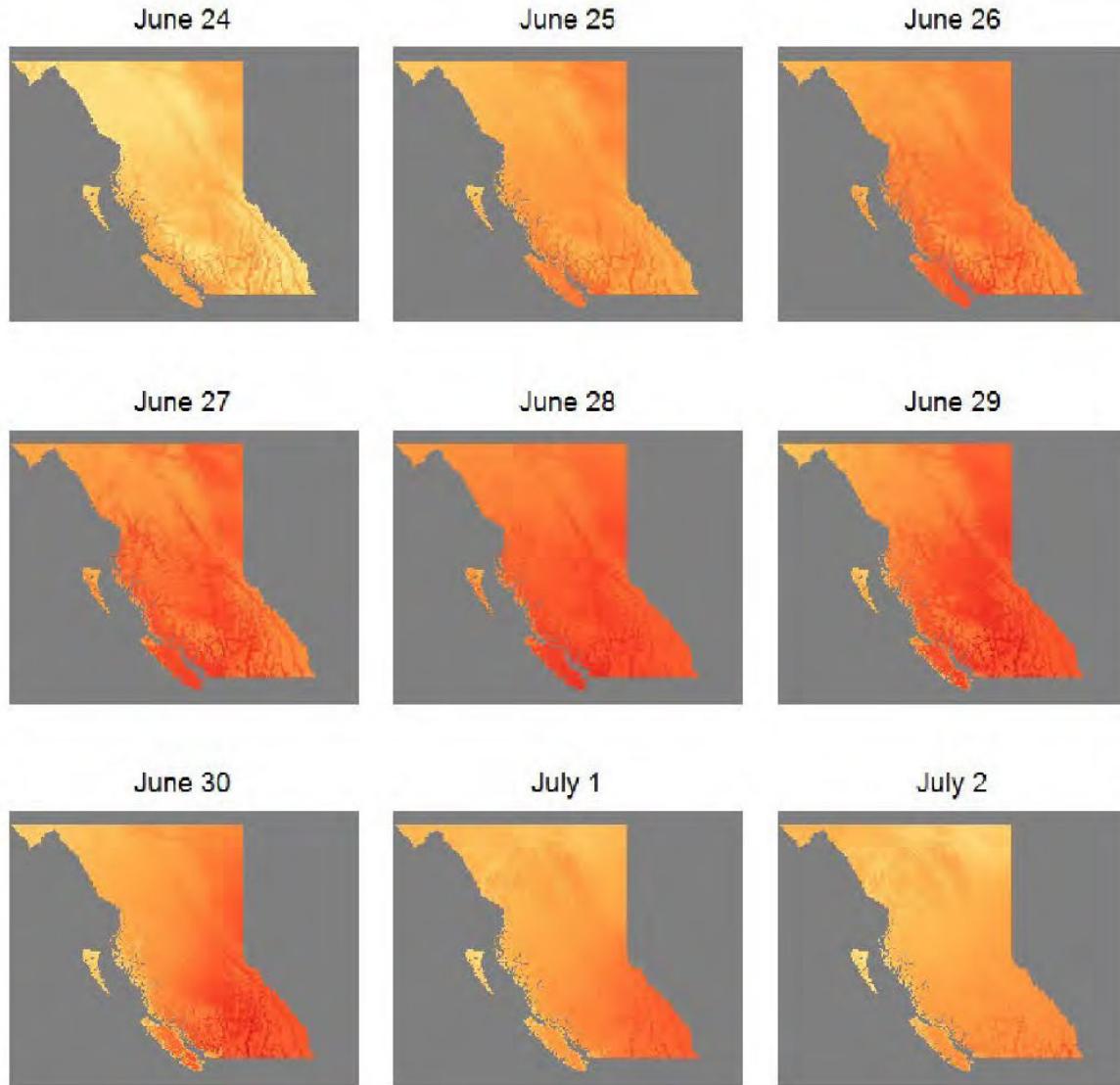
Provincial Health  
Services Authority  
Province-wide solutions.  
Better health.

F21-1172  
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F22-1576  
Page 515 of 693

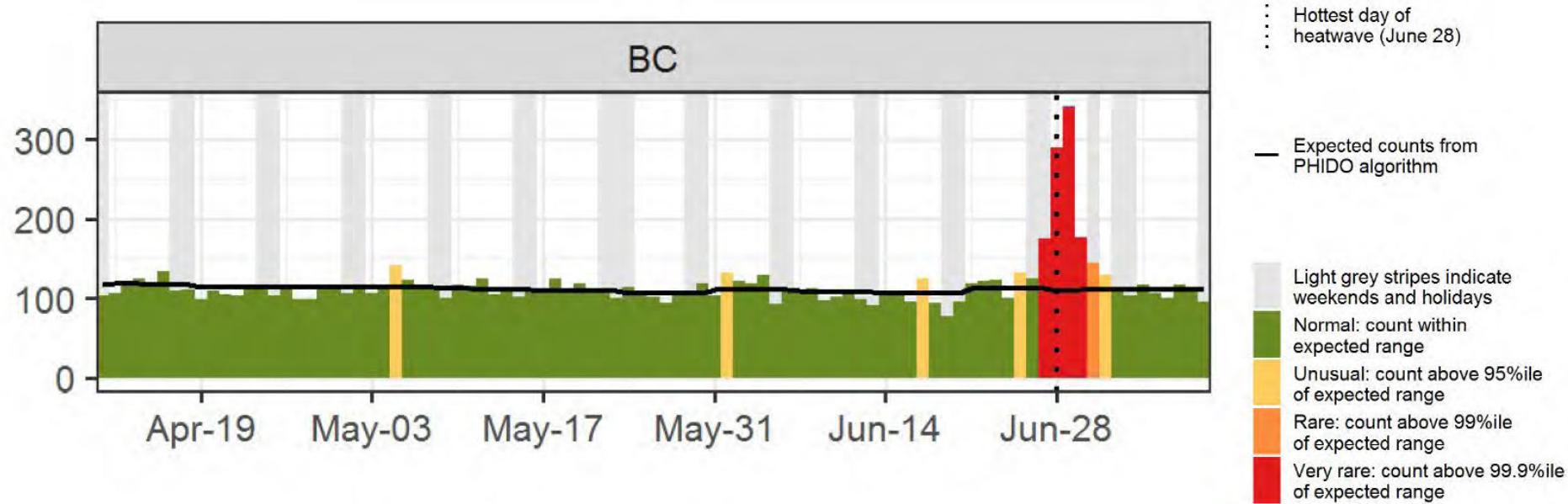
# Most models of excess mortality require data to be aggregated by week

- We are defining June 25 through July 1 as the extreme hot weather event
- June 28 was the hottest day for the entire province
- June 29 was the hottest day in the Interior region



# Provincial mortality was highest on the day after the hottest day, approximately 3X typical daily mortality in summer

- The effects of the event were seen for days after the highest temperatures had passed, likely due to buildup of indoor temperatures



# Estimated excess mortality for week of June 25 to July 1

- We use three different statistical approaches to compare observed deaths with expected deaths estimated data from the past five years.

Region	Mean Estimate	% Increase Over Expected
BC	630	85%
Fraser Health	300	125%
Vancouver Coastal	140	95%
Island	85	55%
Interior	85	55%
Northern	20	40%

\* All estimates rounded to the nearest 5

- Estimates generated on July 27<sup>th</sup>
- Death registrations for the hot weather period are stabilizing, but still not complete
- Number still lower than what BCCS likely to report

## Most excess deaths could not be linked to care facilities

- We can link deaths to known long-term care, assisted living, and acute care facilities by 6-digit postal code
- Cannot account for deaths at rural postal codes (V0? ???) or facilities with shared postal codes
- More specific information on location of death will be available from Vital Statistics over the coming weeks, this is a rough first pass

Setting	Mean Estimate	% Increase Over Expected
All	630	85%
<b>Not Linked</b>	<b>485</b>	<b>175%</b>
Acute Care	90	30%
Long-Term Care and Assisted Living	55	30%

\* All estimates rounded to the nearest 5

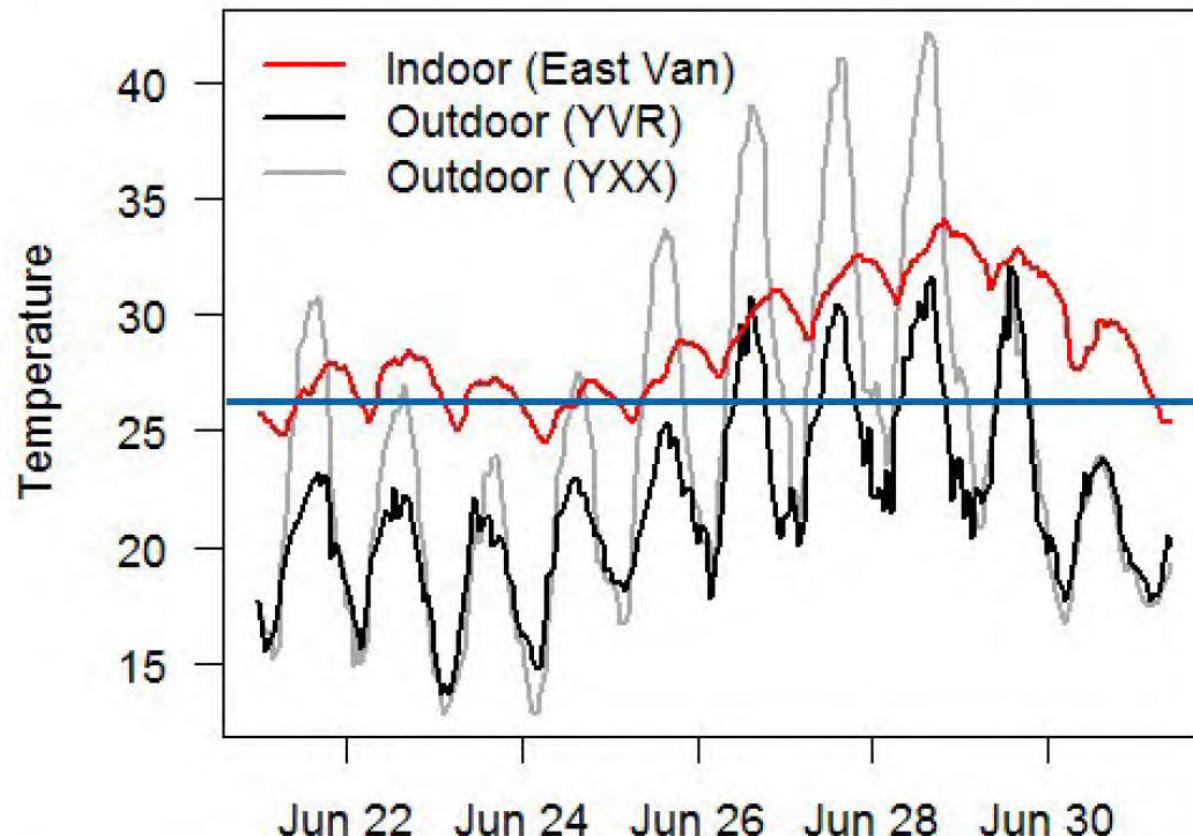
# Most excess deaths occurred in those aged 50+, with the biggest increase among the oldest adults

- Social isolation cannot be assessed with available data, but early information from BCCS suggests that it was an important factor

Age Category	Mean Estimate	% Increase Over Expected
All	630	85%
<50	15	25%
<b>50-64</b>	<b>75</b>	<b>75%</b>
<b>65-74</b>	<b>125</b>	<b>90%</b>
<b>75-84</b>	<b>165</b>	<b>90%</b>
<b>85+</b>	<b>245</b>	<b>95%</b>

\* All estimates rounded to the nearest 5

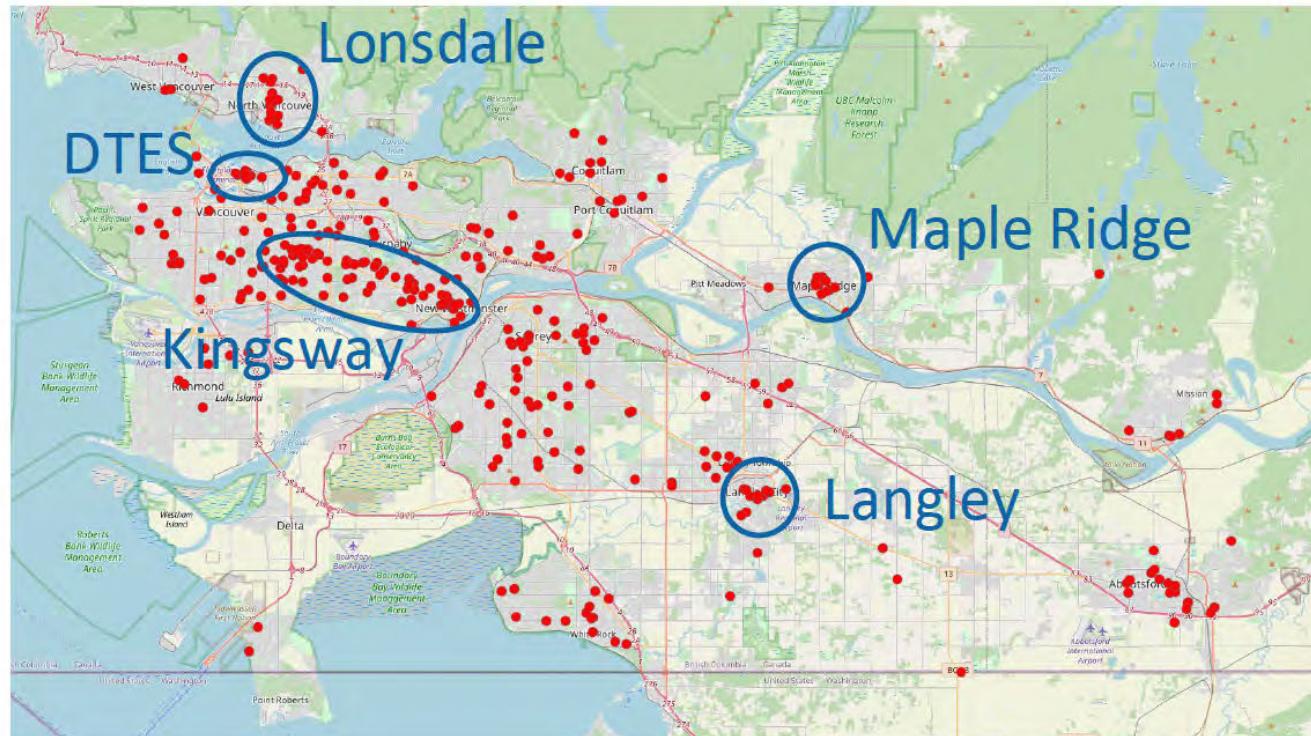
# Susceptible individuals living alone in very hot indoor environments were likely at highest risk



- There is no national or international threshold for safe indoor temperatures
- Toronto Public Health uses a value of  $26^{\circ}\text{C}$
- **Older adults and people with compromised health may not be able to perceive that they are dangerously hot**
- This is especially concerning for those living alone

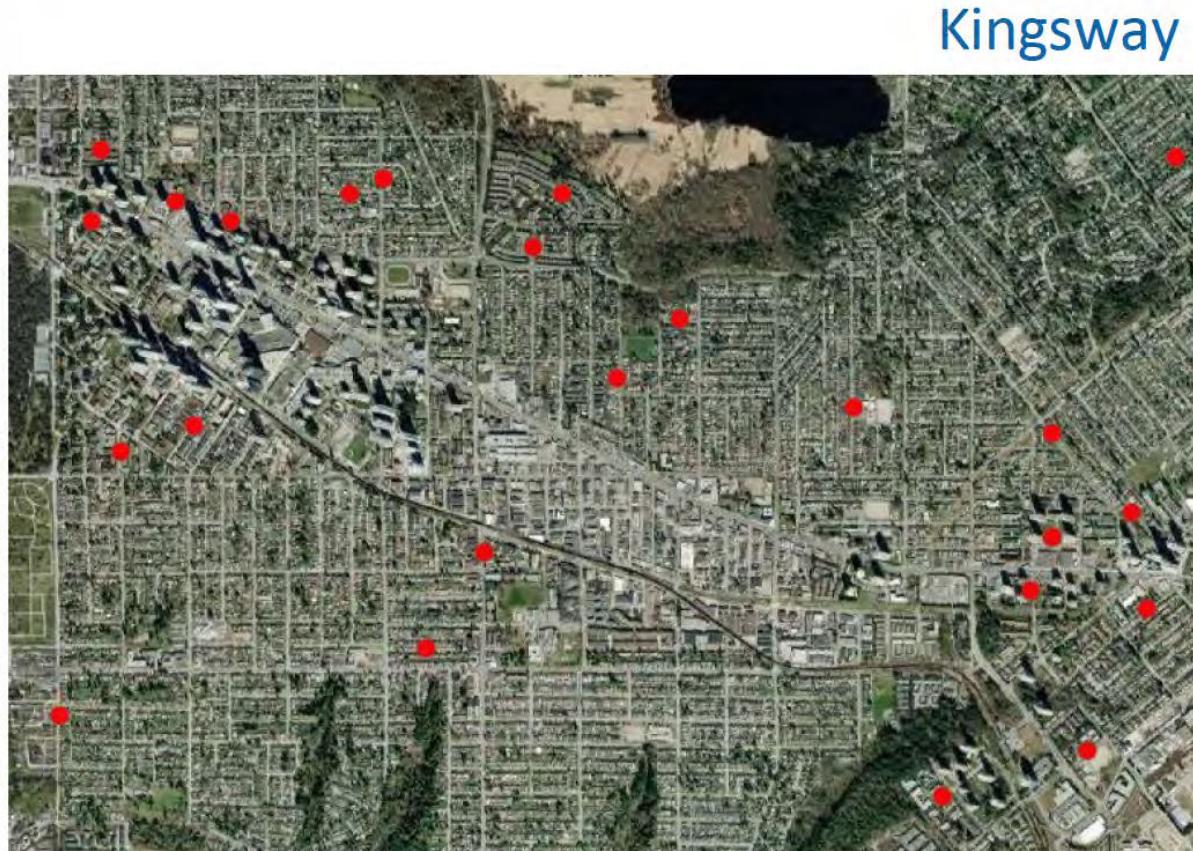
# Deaths not linked to care facilities were widely distributed, but there are some patterns in the Lower Mainland

- Map shows deaths not linked to care facilities on the five highest-mortality days (June 27 – July 1)
- 520 deaths registered so far provincially, compared with 120 expected in this group



# Visual inspection shows potential urban heat island features in cluster areas

- We do not have access to information on specific context of death
- Details such as cardinal orientation of windows are important
- This may come from BCCS investigation, but that will take months to complete





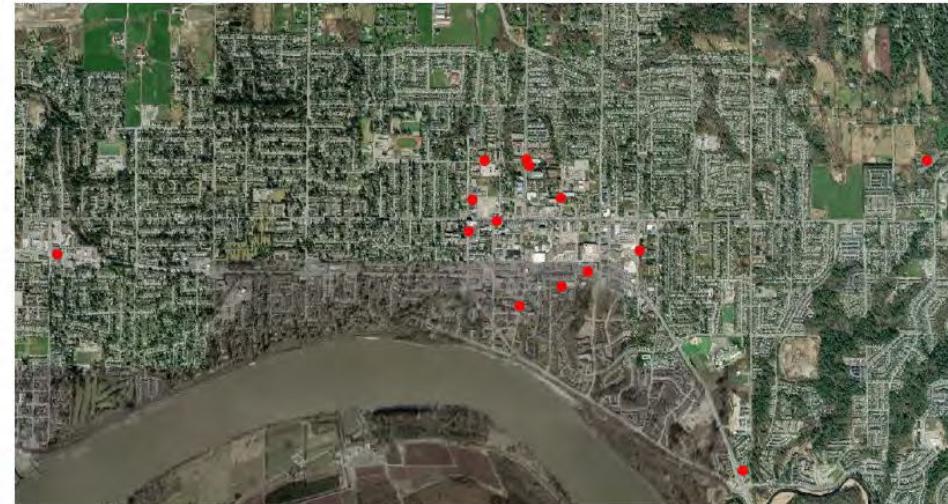
Lonsdale  
New Westminster



DTES



Maple  
Ridge



# BCCDC has started a rapid case-control study comparing out-of-care deaths during the hot weather event with out-of-care deaths during early summer in other years

- Local maximum temperature
- Neighborhood deprivation
- Local climate zone classification
- Building density
- Neighborhood greenness
- Local tree canopy
- Distance to major road
- Distance to nearest library or community centre

Residential greenness index	Increased risk of mortality during 2009 event
High	reference
High/moderate	1.99 [1.08 – 2.63]
Moderate	2.26 [1.25 – 4.07]
Moderate/low	3.59 [2.03 – 6.35]
Low	3.64 [2.06 – 6.44]

