EVALUATION OF THE COVID-19 CONTACT TRACING PROGRAM IN KING COUNTY, WA, USA

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BACKGROUND

- Case investigation and contact tracing (CI/CT) were widely used during the first years of the COVID-19 epidemic but have recently been deemphasized in the United States.
- Few data exist to inform decisions about how much to invest in CI/CT.
- We evaluated the Public Health – Seattle & King County (PHSKC) CI/CT program, including its reach, timeliness, and case-reported impact on I&Q adherence.

METHODS

- Between June 2020 and July 2021, the CI/CT case interview assessed: case demographics, recently visited places, contacts, and service needs
- We used an internally developed Social and Economic Risk Index (SERI), which applies a confirmatory factor analysis to census tract-level indicators to create a standardized index score for case prioritization when necessary.

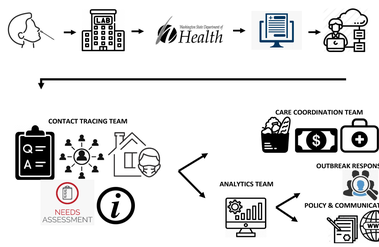


Figure 1: Depiction of COVID-19 Case Surveillance, Contact Tracing, and Response in King County, Washington
After testing for SARS-CoV-2, positive tests were sent to the state health department and then processed for contact tracing. Contact tracers collected demographics, symptoms, places visited, and contacts which was then sent to other teams at the health department.

- In March 2021, a random sample of cases completed an End of I&Q Survey to assess their adherence to I&Q guidance and opinions of CI/CT.

RESULTS

Case Interview

- The PHSKC CI/CT team attempted to contact 87% of cases diagnosed between July 2020 and June 2021, with 52% of cases assigned to the PHSKC CI/CT team and 35% assigned to the WADOH CI/CT team.
  - Figure 2 illustrates how prioritization and assignment of cases varied with program capacity/epidemiologic trends.

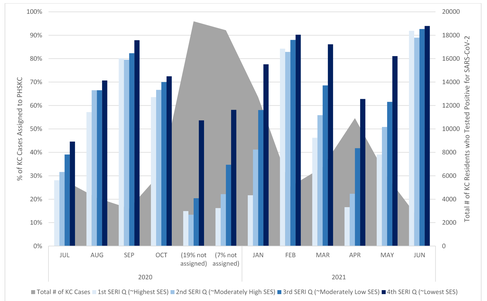
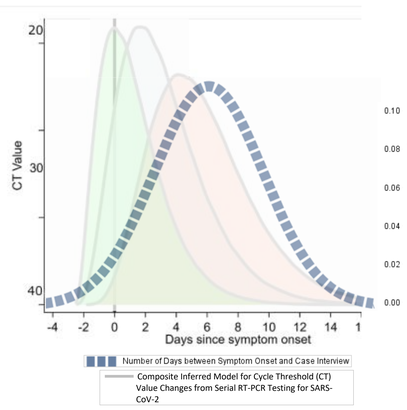


Figure 2: Percent of King County COVID-19 Cases Assigned to PHSKC CI/CT by Month and Socioeconomic Risk Index (SERI)
Blue bars indicate % assigned to PHSKC by SERI Quartiles
Gray Area Indicates Total Number of King County COVID-19 Cases

The integration of COVID-19 contact tracing (CT) with support services may improve cases' adherence with isolation guidelines and diminish pandemic-related hardships.
Despite this, the timing of CT relative to infectiousness and difficulty eliciting non-household contacts likely attenuate the intervention's effect.



	Interviewed Cases n/N (%)	Mean (sd) per case	Total number of contacts & venues reported: Unique (Total)
Cases diagnosed between July 2020-June 2021 who completed PHSKC case interview (n=41,979)			
Case Disclosure of Actionable Information for ≥1:			
Named any household contacts and number contacts named (excl index case)[a]	35,851/42,761 (84%)[g]	2.70 (2.2)	62,048
Named any non-household contacts and number non-household contacts named	4,798/41,979 (11%)[g]	0.28 (1.1)	11,573
Named a recently[h] visited worksite and number worksites named[b]	11,040/14,097 (78%)[g]	0.81 (0.5)	10,634 (14,792)
Named a recently[h] visited non-worksite venue(s) and number venues named	13,343/41,979 (32%)[g]	0.46 (0.8)	11,256 (19,479)
Case-Initiated Exposure Notification			
Notified employer prior to case interview[b,e]	12,580/13,507 (93%)[g]		
Random Sample of PHSKC-Interviewed Cases Completing "End of I&Q Survey" in Mar 2021 (n=304)			
Case-Initiated Exposure Notification			
Notified all household members of their diagnosis [d]	144/149 (97%)		
Non-household contacts directly notified of exposure by case	248/304 (82%)	3.6 (6.8)	
Notified employer[b]	166/176 (94%)		

[a]Restricted to cases with documented household contacts
[b]Restricted to symptomatic cases who reported working in-person the two days preceding or 10 days following symptom onset and asymptomatic cases who reported working in-person the two days preceding or 10 days following date of COVID-19 test specimen collection.
[c] Restricted to cases who tested positive after January 1, 2021, approximately 1 month after the exposure notification application "WA Notify" launched.
[d] Restricted to cases who reported to living with one or more people who had not been diagnosed with COVID-19 at the time of their interview
[e] Restricted to cases with non-missing values

Figure 3 (left): Timing of Case Interview Relative to Inferred Duration of Infectiousness Period of SARS-CoV-2 The area under the dotted line represents the distribution of when case interview was conducted relative to onset of symptoms. The underlying pastel curves are reproduced from Byrne et al. (2020) and represent SARS-CoV-2 viral shedding relative to symptom onset.
Table 1 (above): Disclosure of Contacts and Places Visited during COVID-19 Case Interview and Case-Initiated Exposure Notification, King County, WA, USA

Case Interview (cont.)

- The PHSKC CI/CT team interviewed 41,979 cases (81% of cases contacted) a mean of 6.1 days after symptom onset, and 3.4 days after SARS-CoV2 testing (see Figure 3).

Exposure notification

- Cases disclosed the names and addresses of 10,634 worksites (mean= 0.8/interview) and 11,256 other recently visited locations (mean= 0.5/interview).
- Cases provided contact information for 62,048 household members (mean= 2.7/interview) and 11,573 non-household contacts (mean= 0.3/interview).
- "End of I&Q" Survey participants (n=304, 54% of sampled) reported self-notifying an average of 4 non-household contacts and 97% reported that they notified their household members.

RESULTS (CONT.)

Service Referrals

- The CI/CT team helped arrange testing for 5,650 contacts (2,969 households); facilitated grocery delivery for 7,253 households; referred 9,127 households for financial assistance
- The proportion of households receiving groceries varied by SERI level, with 26% of case-households in highest SERI quartile census tracts receiving groceries versus 12% in the lowest SERI quartile (Figure 4).

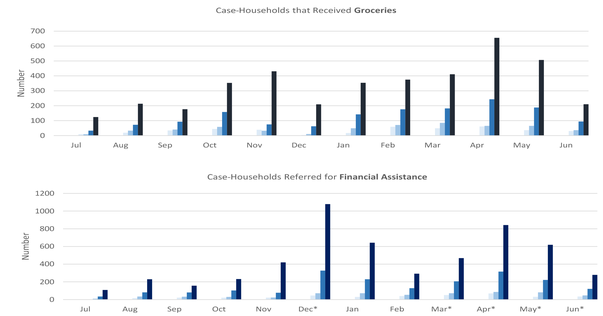


Figure 4: Number and Percent of Case-Households that Received Groceries or were Referred for Financial Assistance, by Socioeconomic Risk Index of Residential (SERI) Census Tract.
*The COVID-19 relief-funded one-time cash stipend and bill assistance programs operated in December 2020 and March-present, respectively.

End of I&Q Survey

- Most survey participants (81%) indicated they had stayed home during their isolation period.
  - Among cases with household contacts, 30% reported that at least one left home when they should have remained in quarantine.
- 69% agreed that the information and referrals provided by the CI/CT team helped them stay in isolation.

CONCLUSIONS

- We provided tens of thousands of households with prevention education and guidance and support services, which likely improved cases' adherence with isolation guidelines.
  - Our adoption of a prioritization strategy (SERI) allowed our team to focus outreach on parts of the county most impacted by the pandemic.
- Although cases were often unwilling to provide information for contacts, survey participants indicated that they self-notified at least some non-household contacts without the direct involvement of CI/CT staff.
- The epidemiologic impact of the intervention is uncertain; many people received CI/CT outreach after their period of greatest infectiousness.

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