COCHISE COUNTY Arizona

THE UNIVERSITY OF ARIZONA
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COVID-19 IN COCHISE COUNTY: USING STATISTICAL AND DESCRIPTIVE ANALYSES TO IDENTIFY HIGH-RISK POPULATIONS

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OUTLINE

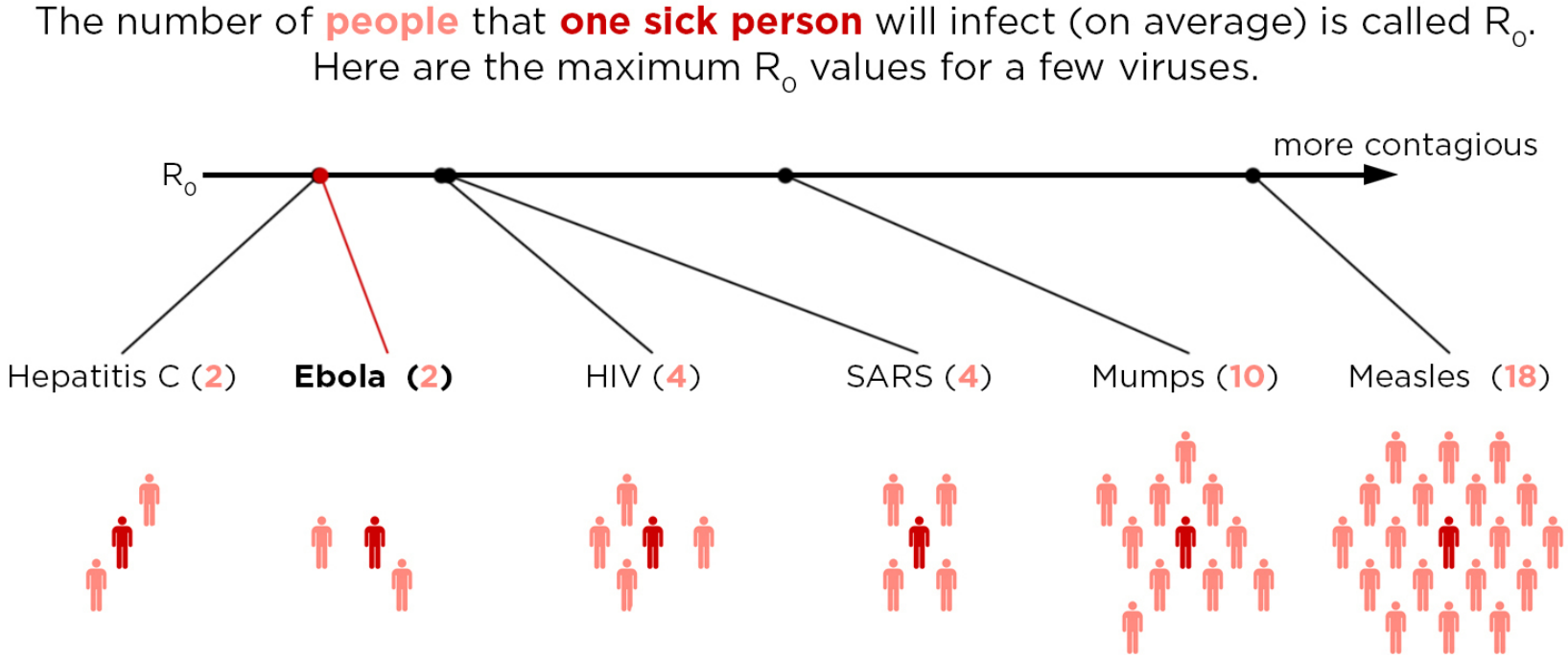
- Cochise County COVID-19 R_0
- Descriptive analysis of COVID-19 risk factors in Cochise County

WHAT IS R_0?

- Useful to identify COVID-19 transmission hot spots
- Limitations (Delamater et al., 2019)
  - Varies depending on:
    - Geographical location
    - Time
    - Social/behavioral trends
  - Assumes exposure only occurs within defined location
- Calculation (Pandit, 2020):

$$R_0 = \frac{\beta}{\mu}$$

β = rate of infection
μ = rate of recovery



Source: (Doucleff, 2014)

Table 1: Mean R0 and median, min, and max daily R0 for COVID-19 in Cochise County AZ, stratified by year total through November 30th, 2020, month, and event.

	Mean Ro (SD)	Median Ro	Min Ro	Max Ro
Cochise County				
March 12th – Nov. 30th	1.04 (0.17)	1.01	0.47	2.00
Month				
March	1.15 (0.32)	1.00	1.00	2.00
April	1.00 (0.23)	1.00	0.71	1.86
May	1.11 (0.23)	1.08	0.75	2.00
June	1.05 (0.05)	1.05	0.96	1.14
July	0.98 (0.07)	0.98	0.85	1.17
August	0.97 (0.19)	0.98	0.47	1.74
September	1.02 (0.11)	1.01	0.79	1.27
October	1.05 (0.09)	1.04	0.90	1.34
November	1.05 (0.08)	1.05	0.91	1.27
Event				
Pre-AZ Shutdown	1.15 (0.32)	1.00	1.00	2.00
AZ Shutdown	1.03 (0.25)	1.00	0.71	2.00
1st Wave (Post-AZ Shutdown)	1.04 (0.11)	1.03	0.85	1.70
Back-to-School	1.00 (0.16)	1.00	0.47	1.74
2nd Wave (Fall)	1.05 (0.09)	1.04	0.90	1.34

Ro RESULTS (GENERAL)

Ro RESULTS STRATIFIED BY CITY

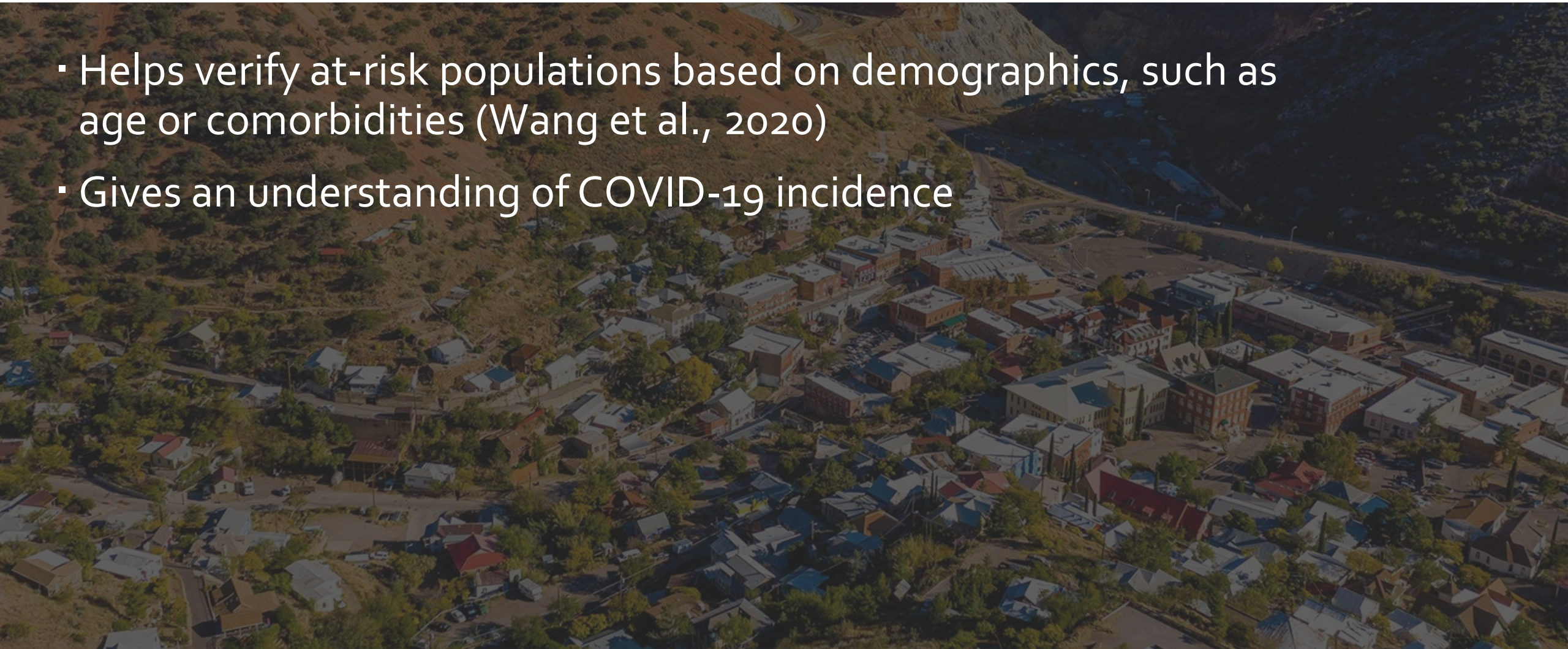
Table 2: Mean R0 and median, min, and max daily R0 for COVID-19 for the top ten-affected cities in Cochise County through November 30th, 2020

	Mean Ro (SD)	Median Ro	Min Ro	Max Ro
Benson	1.03 (0.27)	1.00	0.00	3.00
Bisbee	1.02 (0.29)	1.00	0.00	3.00
Douglas	1.04 (0.27)	1.00	0.00	3.00
Fort Huachuca	1.01 (0.29)	1.00	0.00	3.00
Hereford	1.03 (0.34)	1.00	0.00	3.50
Huachuca City	1.02 (0.41)	1.00	0.00	6.00
Naco	1.02 (0.23)	1.00	0.00	2.33
Pirtleville	1.01 (0.26)	1.00	0.00	2.00
Sierra Vista	1.14 (0.20)	1.09	1.00	2.20
Willcox	1.03 (0.25)	1.00	0.00	3.00

POSSIBLE IMPLEMENTATIONS

- If caught in a timely manner, R_0 can indicate which cities need additional health messaging
- Can aid in investigating super-spreader events

DESCRIPTIVE ANALYSIS PURPOSE



- Helps verify at-risk populations based on demographics, such as age or comorbidities (Wang et al., 2020)
- Gives an understanding of COVID-19 incidence

SYMPTOMS

Table 3: Frequency and percentage of Cochise County residents diagnosed with COVID-19 between March 12th and November 30th, 2020 who report experiencing symptoms.

Experienced Symptoms	Number of Cases	% of total cases
Yes	863	31.28
No	1896	68.72

Table 4: Demographic summary of number and percentage of Cochise County residents diagnosed with COVID-19 between March – November 2020 who report experiencing symptoms, stratified by age.

Age group (years)	Number of Cases experiencing COVID-19 symptoms	% of total cases in each age group
<11	27	19.71
11 – 20	75	25.34
21 – 30	144	30.19
31 – 40	50	32.19
41 – 50	134	31.90
51 – 60	127	33.51
61 – 70	84	31.34
71 – 80	70	35.00
81 – 90	43	43.43
91 - 97	9	52.94

AGE INFLUENCE ON SYMPTOMS

Table 5: Demographic summary of number and percentage of Cochise County residents diagnosed with COVID-19 between March – November 2020 who reported working in a high-risk occupation, stratified by age

Age group (years)	Number of Cases	% of total cases in age group
<11	4	2.92
11 – 20	23	7.77
21 – 30	42	8.81
31 – 40	47	10.09
41 – 50	48	11.43
51 – 60	26	6.86
61 – 70	16	5.97
71 – 80	21	10.50
81 – 90	15	15.15
91 - 97	3	17.65

HIGH-RISK OCCUPATIONS

Table 6: Frequency and percentages of Cochise County residents who were both diagnosed with and reported experienced symptoms of COVID-19 between March 12th – November 30th, 2020, stratified by selected comorbidities.

	Number of COVID-19 Cases	% Experiencing COVID Symptoms	Pearson χ^2 Statistic
Immunocompromised			
Yes	111	95.50	< 0.0001
No	2648	28.59	
Diabetes			
Yes	120	90.83	< 0.0001
No	2639	28.57	
Hypertension			
Yes	177	87.57	< 0.0001
No	2582	27.42	
Allergies			
Yes	190	94.21	< 0.0001
No	2569	23.23	
History of Smoking			
Yes	99	94.95	< 0.0001
No	2660	28.91	

COMORBIDITIES AND SYMPTOMS

SUMMARY

- Stratifying R_0 by city and time can aid in identifying COVID-19 high-risk locations
- Less than half of interviewed Cochise County residents diagnosed with COVID-19 report experiencing symptoms
- Number of cases diagnosed with COVID-19 who report experiencing symptoms increases with age
- Low percentages of cases diagnosed with COVID-19 from each age group report working in high-risk occupations
- High percentages of cases diagnosed with COVID-19 who also have comorbid conditions report experiencing COVID-19 symptoms

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