

Introduction

The COVID-19 pandemic has required military organizations to develop risk mitigation strategies in order to continue with mission-essential activities, which includes the training of new military recruits.

The U.S. Air Force's Basic Military Training, conducted at Lackland Air Force Base, has a weekly intake of approximately 800 new trainees. An empirical strategy of having new recruits quarantine at home for 2 weeks prior to arrival at Lackland Air Force Base is reasonable. However, the extent to which this strategy mitigates the risk of importing COVID-19 into the recruit population is unknown.

This study explores the risk of importing COVID-19 from areas of high transmission, compared with areas of low transmission, into a military training environment.

Methods

A retrospective cohort study of all Basic Military Training students, arriving at Lackland Air Force Base between 23 June 2020 and 24 September 2020 (n = 10,023) was conducted to determine the likelihood of testing positive for COVID-19 after arrival, based on home community incidence rates in the two weeks preceding the trainees' arrival at Lackland.

We retrieved recruit age, home county, and COVID test dates and results from military personnel records. We then obtained population, daily COVID-19 incidence rates, and daily COVID death rates, for each recruit's home county.

Each individual was assigned the 14-day average daily incidence rate of COVID per 100,000 for their home county, rounded to the nearest integer.

These incidence rates were then sorted and categorized into quartiles. Logistic regression was used to calculate the likelihood of testing positive for COVID, by PCR, based on incidence rate of the individual's home county.

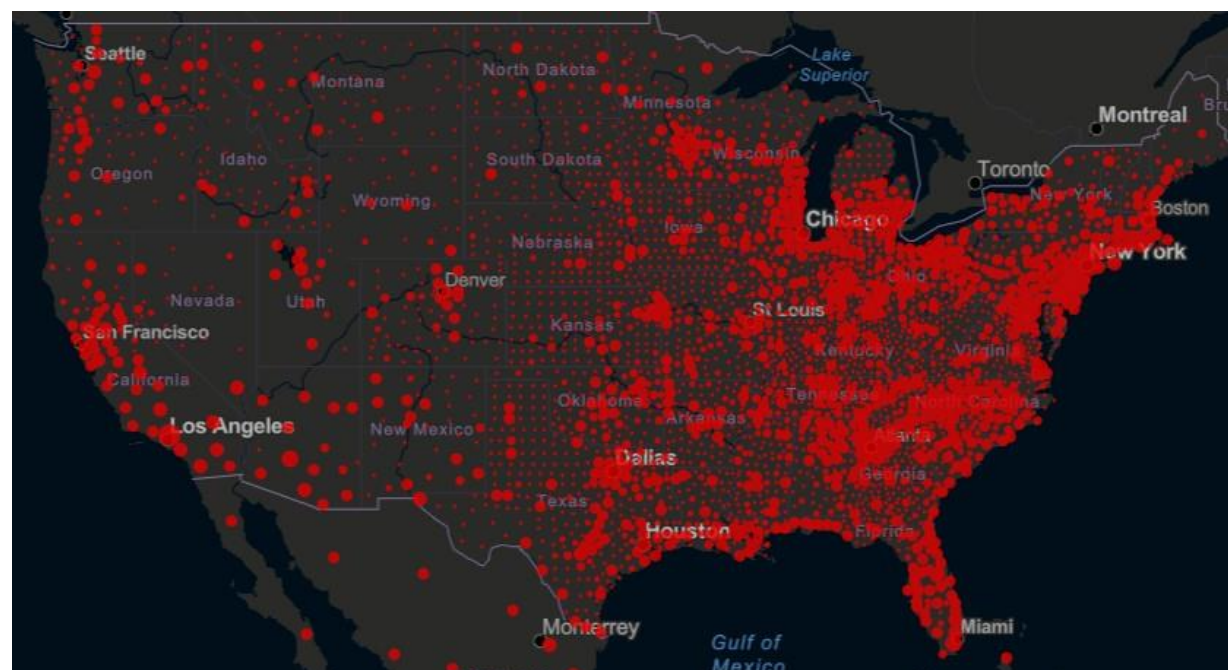


Fig 1. Cumulative Incidence in USA. Source: COVID-19 Dashboard by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University, accessed 12 May 2021.

Results

Table 1. Recruits at Lackland Air Force Base between 23 June and 24 September 2020 (N = 10,023).

Quartile	COVID-19 (+) Within 2 Weeks of Arrival		p-value
	Positive	Negative	
1 (%)	27 (1.03)	2584 (98.97)	Ref
2 (%)	26 (1.05)	2453 (98.95)	0.94
3 (%)	41 (1.65)	2442 (98.35)	<0.01
4 (%)	56 (2.29)	2394 (97.71)	<0.001

Abbreviations: SD, standard deviation.

Table 2. Logistic Regression of positive COVID-19 cases among recruits at Lackland Air Force Base between 23 June and 24 September 2020, within 2 weeks of arrival (N = 10,023).

Quartile	IR Range	Number of Recruits	OR (95% CI)
1	0 - 5	2611	Ref
2	6 - 10	2479	1.014 (0.590-1.743)
3	11 - 18	2483	1.607 (0.985-2.620)
4	≥19	2450	2.239 (1.410-3.555)

Abbreviations: IR, daily incidence rate per 100,000 population; OR, odds ratio; CI, confidence interval.

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The opinions and assertions expressed herein are those of the authors and do not necessarily reflect the official policy or position of the Uniformed Services University or the Department of Defense.

Results

Recruits came from all 50 states, the District of Columbia, Guam, Northern Mariana Islands, and Puerto Rico. A total of 1760 unique home counties were identified.

Logistic regression showed a 1.47% higher odds of an individual testing positive for COVID-19 during their first two weeks after arrival at Lackland Air Force Base for every 1 per 100,000 increase in daily incidence of the individual's home county (p=0.0055).

There was no correlation between home county incidence rate and testing positive at any time during the 8-week Basic Military Training (p>0.05). However, when categorized into quartiles, by home county incidence rate, the highest quartile was 2.24 times more likely to test positive for COVID-19 within 2 weeks of arrival, compared with the lowest quartile.

Conclusions

The strategy of a 14-day restriction of movement at the home of origin of incoming trainees, prior to arrival at Lackland Air Force Base, was reasonably effective at reducing the risk of COVID-19 transmission.

However, risk associated with the level of disease transmission within the individual's home community was not entirely mitigated through this non-pharmacologic intervention.

A more stringent 14-day quarantine, in which the individual is completely isolated from interaction with others, would have better mitigated the risk of importing COVID-19 into the training establishment. This study suggests incoming trainees continued to be exposed to COVID-19 in the 14 days prior to arrival, whether during their quarantine, or during their travel to Lackland.

Non-pharmaceutical interventions remain important to interrupting disease transmission in a military recruit environment, even following a 14-day restriction of movement prior to arrival.

A similar policy of voluntary, self-enforced quarantine prior to travel from a community with high communicable disease burden should, in theory, work in non-military settings (ie. prior to arrival at college campuses or summer camps) but would be limited by variable compliance with these measures.