A *Total–Harm–Minimization* Framework for Developing Expedient and Low–Risk Return–to–the–Workforce Policies During the COVID–19 Pandemic

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Executive Summary

Objective: Define a framework to develop a *Total–Harm–Minimization* policy to address the COVID–19 crisis in consideration of both economic and health risks.

We describe a framework that is tolerant to the uncertainty in our current knowledge of COVID–19 that: (a) requires a very small number of assumptions; (b) involves minimal mathematical modeling; and (c) may result in acceptably low community health risk, given (a) and (b).

KEY FEATURES OF THE FRAMEWORK

- **May be implemented promptly** at the local level at relatively low cost.
- **Requires only minimal modeling** of epidemiology or the structure of the financial systems.
- **Conserves scarce COVID–19 virus tests** which are currently in short supply.
- **Immediatley leverages available health data to risk–stratify the population**, while additional critical data–gathering projects proceed.
- **Optimizes objectives of workforce return and infection minimization** (prior to approved vaccination), by prioritizing:
  - Continued physical separation for knowledge workers.
  - Clearing "contact" employees in order of their impact on functional, social & economic utility activities.
- **Less likely than many other approaches to worsen the severity or duration of the COVID–19 pandemic**, while also advancing progress towards the potential for herd immunity to achieve system–wide "all–clear."

This framework, of course, accommodates adjustments/extensions informed by successes in other U.S. or global contexts.

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Note to reader: This material is CONFIDENTIAL. While we believe that the concepts outlined in this note provide a useful framing for this problem, the details of their implementation and execution are beyond the scope of this work and, in some cases, beyond the current working group's detailed knowledge. As such, this is not intended as a recommendation or policy proposal. In this draft, we prioritize expediency in circulating for comment the broad strokes of the framework over detailed debate and analysis.

An Overview of a *Total–Harm–Minimization* roadmap for developing return–to–the–workforce policies

OVERARCHING GOAL

It is critical to resume economic activity and social interaction while minimizing risks of further viral contagion, despite current incomplete epidemiological data on COVID–19.

RISK MANAGEMENT FRAMEWORK (See Figure 1)

Prioritizing return–to–the–workforce:

- Identify industries and companies that have large functional or economic impact.
- Identify members of the workforce within these industries who may return to work soon because remote work is not feasible (see Figure 3);[a] **and**
  - (a) risk of transmission deemed acceptably low due to the presence in their blood of an effective antibody post–infection *if this is supported scientifically*[b]; or
  - (b) either
    - negative COVID–19 virus test confirmed (and re–validated daily) at physical access point;[c]
    - effective models are developed to reliably predict which individuals will tolerate exposure with acceptably low health consequences (e.g., on the order of the seasonal flu).[d]

[a] See, e.g., Dingel, J. and B Neiman (2020), "How Many Jobs Can be Done at Home?"

[b] There is some debate on this point: See, e.g., Le Page, M. (2020) "Will a home antibody test for covid–19 really be a game changer?" , but also WHO (2020) "Immunity passports" in the context of COVID–19

[c] Note that pooled testing procedures can substantially increase throughput speed and lower cost in many cases. See, e.g., Bilder, C. R. and J.M. Tebbs (2012). "Pooled testing procedures for screening high volume clinical specimens in heterogeneous populations." for an overview.

[d] see, e.g., Stein, R.M., (2005). "The relationship between default prediction and lending profits: Integrating ROC analysis and loan pricing." for details of using rankings or models to determine greenlight cut–offs and an example from economics.

Workforce triage and clearance

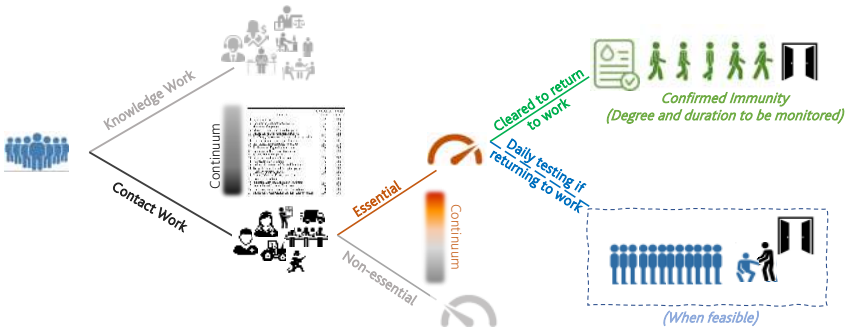

Figure 1: Triage, prioritization and monitoring of employee return–to–the–workforce policies

An example outline showing some of the worked–out detail for applying the framework can be found in the document entitled *An Example Outline for Applying the* Total–Harm–Minimization*Framework for Developing a Return–to–the–Workforce Policy*.

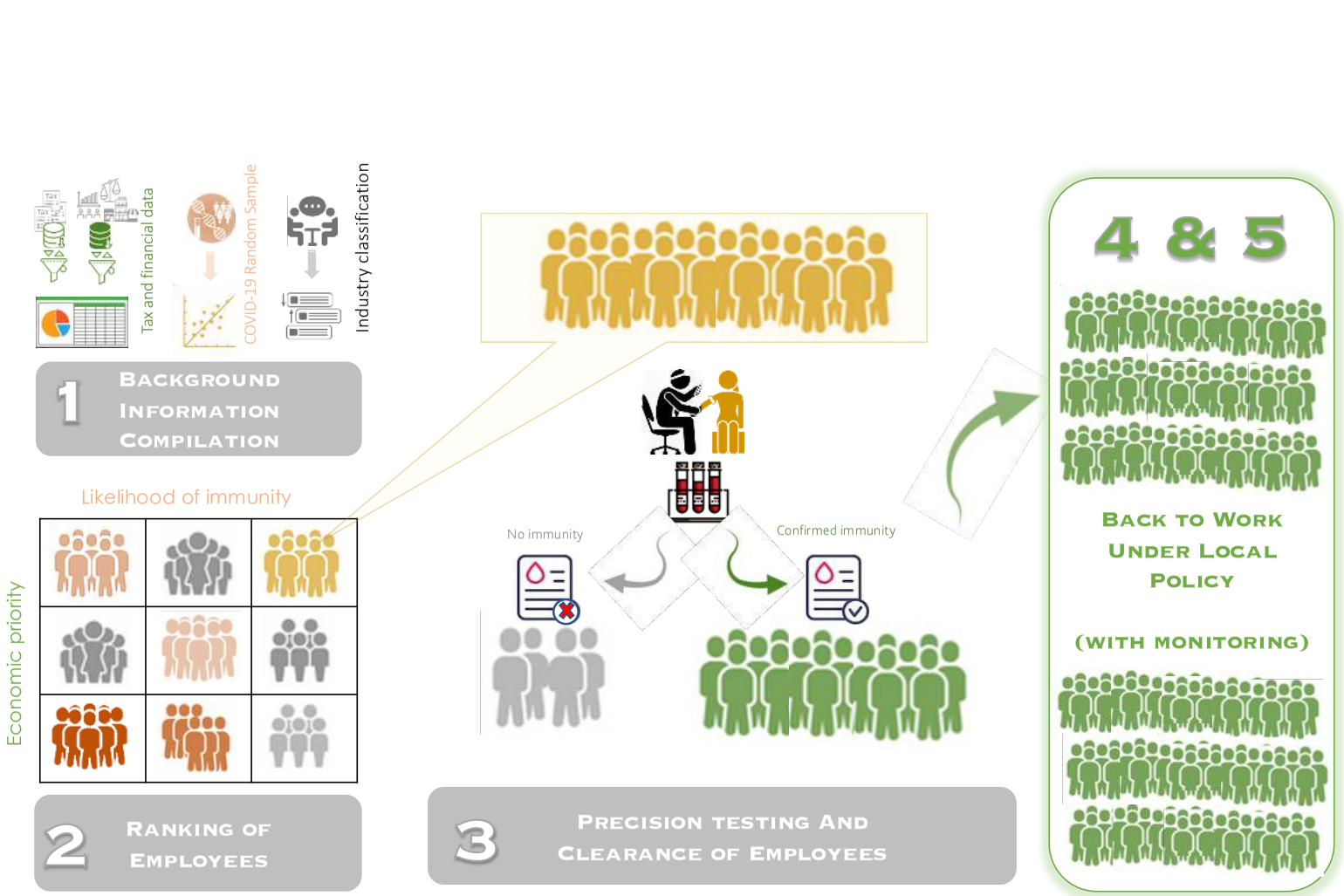

Figure 2: Conceptual schematic of policy development framework

Step 1: Compile background information on (a) COVID–19 incidence, recovery and mortality; and (b) economic and demographic profiles of employers. *Step 2: Rank population of asymptomatic individuals for testing* based on likelihood of having confirmed immunity/low susceptibility and economic impact of re–turn to workforce. *Step 3: Conduct targeted testing for COVID–19 antibodies (not virus)* based on ranking in Step 2. *Step 4: Formulate policy* based on results of testing, including roll–back plan and monitoring protocol for returned workers. *Step 5: Implement policy* in staged fashion with monitoring.

	Occupation	O*NET-derived baseline	Manual alternative
23	Legal Occupations	0.97	0.84
15	Computer and Mathematical Occupations	0.95	1.00
11	Management Occupations	0.84	0.84
25	Education, Training, and Library Occupations	0.82	0.85
13	Business and Financial Operations Occupations	0.78	0.92
27	Arts, Design, Entertainment, Sports, and Media Occupations	0.73	0.57
43	Office and Administrative Support Occupations	0.65	0.51
19	Life, Physical, and Social Science Occupations	0.51	0.36
17	Architecture and Engineering Occupations	0.50	0.88
21	Community and Social Service Occupations	0.37	0.50
41	Sales and Related Occupations	0.28	0.21
39	Personal Care and Service Occupations	0.18	0.00
33	Protective Service Occupations	0.06	0.00
29	Healthcare Practitioners and Technical Occupations	0.05	0.06
53	Transportation and Material Moving Occupations	0.03	0.00
31	Healthcare Support Occupations	0.02	0.00
45	Farming, Fishing, and Forestry Occupations	0.01	0.00
51	Production Occupations	0.01	0.00
49	Installation, Maintenance, and Repair Occupations	0.01	0.00
47	Construction and Extraction Occupations	0.00	0.00
35	Food Preparation and Serving Related Occupations	0.00	0.00
37	Building and Grounds Cleaning and Maintenance Occupations	0.00	0.00

Figure 3: Ranking of jobs by degree to which work may be done remotely (*from Dingel and Neiman,2020*)

This table orders major occupations by the degree to which the occupations may be performed remotely from home. (See: Dingel, J. and B Neiman (2020), "How Many Jobs Can be Done at Home?", Table 3 for details.)