

Pandemic Impacts on Freight Demand and Ecommerce

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Background



Top Lessons Learned from Our Disaster Research Fieldwork ...

- Disaster Response is a Socio-Technical Process
- Disasters ≠ ≠ ≠ ≠ ≠ ≠ ≠ ≠ ≠ Catastrophes
- Commercial Logistics ≠ ≠ ≠ Post-Disaster Logistics
- Controlling Material Convergence is a MUST
- In Catastrophes: Local Distribution Is the Challenge, Only option: Collaborative Aid Networks
- Effective Private Sector Integration is KEY
- Supply and Demand Are Very Dynamic, Be Ready
- **Controlling “Panic Buying” Is Essential**
- Preventing Collapse of Private Supply Chains is Key
- Comprehensive Approaches Are Needed

Holguin-Veras et al. (2016). Disaster response logistics: chief findings of fieldwork research. In C. W. Zobel, N. Altay, & M. P. Haselkorn (Eds.), *Advances in Managing Humanitarian Operations* Springer

Disaster Related Buying Behaviors (DRBBs) vs. "Panic Buying"

- "Panic buying" is a misnomer
 - A human reaction to concerns about shortages that may occur when disasters are expected, or have occurred... nevertheless the practice is problematic
- Recommended term Disaster Related Buying Behaviors (DRBBs):
 - Definition: "*the purchase of supplies by individuals and/or businesses in anticipation of, during, and after the disaster with a different pattern than the one in normal conditions*"
 - Manifestations: Purchasing larger quantities, Purchasing more frequently, Changing retailers, Switch to ecommerce, Substitute products, Stop buying products, etc.
 - Outcome: To increase inventory of basic supplies → Hoarding
- DRBBs appear in ALL large disasters and catastrophes
 - One of the key issues to be addressed to ensure effective disaster response
 - See: Holguin-Veras et al. (2016). Disaster response logistics: chief findings of fieldwork research. In C. W. Zobel, N. Altay, & M. P. Haselkorn (Eds.), *Advances in Managing Humanitarian Operations*

The Reasons of Shortages

- Basic Supplies, typically have:
 - Very steady demand patterns
 - Low profit margins
 - Net result: In normal conditions, there is no need to have large inventories
- In the immediate term:
 - In case of sudden and drastic increases in demand, supply cannot cope
 - This creates a market failure, that may require public sector intervention
- Only alternative → To manage the sudden surge in demand



(Pictures taken by JHV on March 12, 2020)

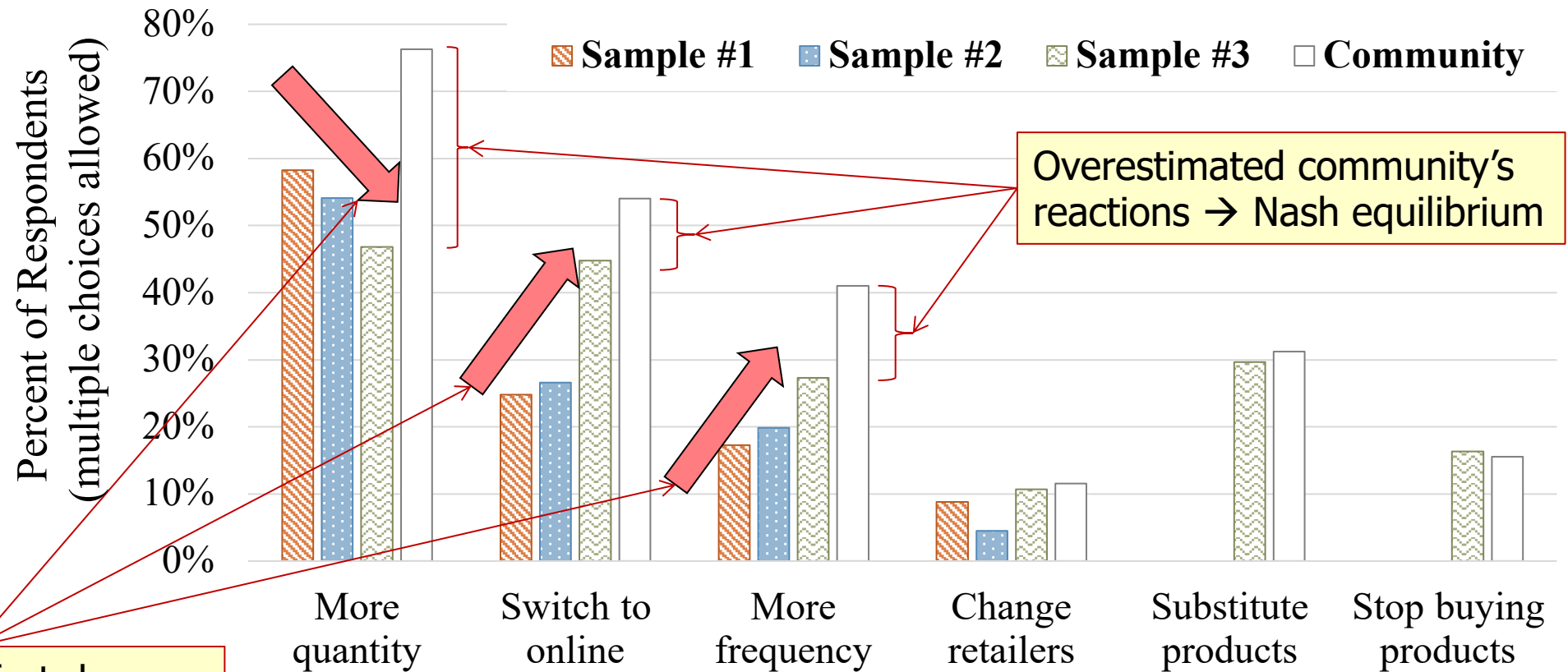
Purchasing Patterns: (US and International Data)



DRBBs April/May, June, October 2020 (USA)

Bold fonts → statistically equal

- Shortages Reported: **(46.11%, 40.98%, 62.48%)**
- Percent that enacted DRBBs: **(78.63%, 78.52%, 80.89%)**

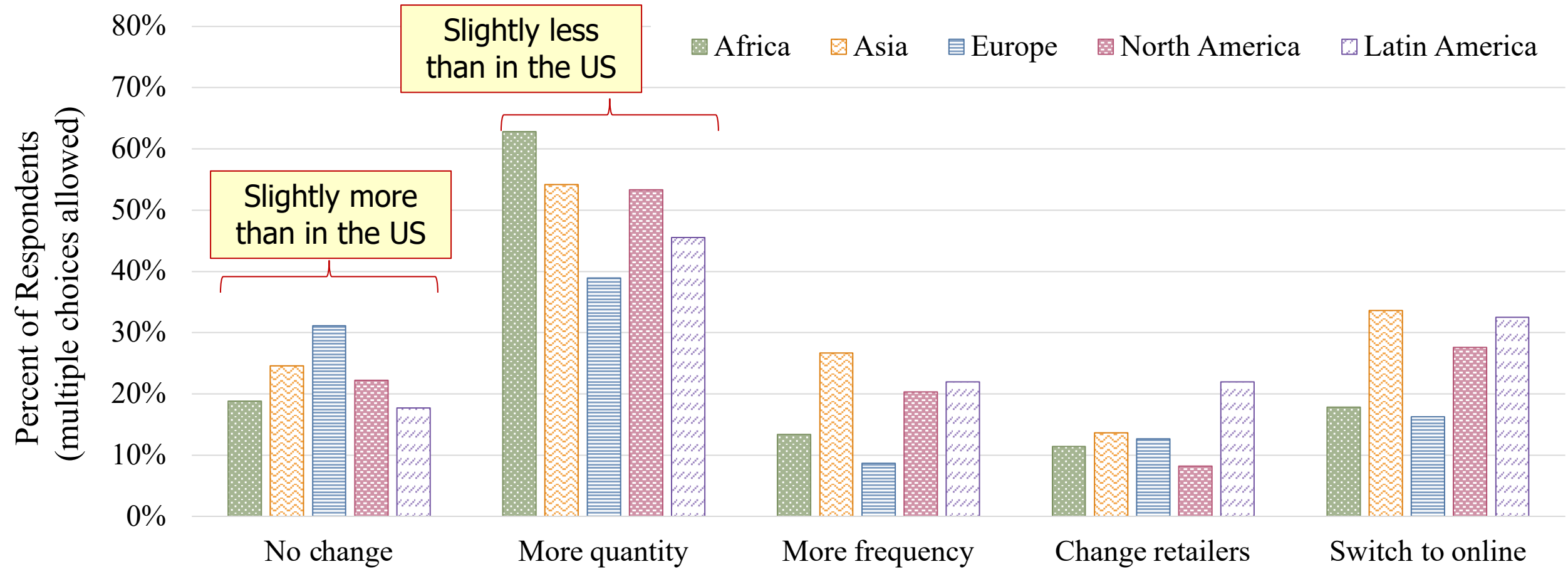


Ecommerce effect: lower quantities purchased, more frequent purchases

Overestimated community's reactions → Nash equilibrium



DRBB Manifestations Across the World (International)



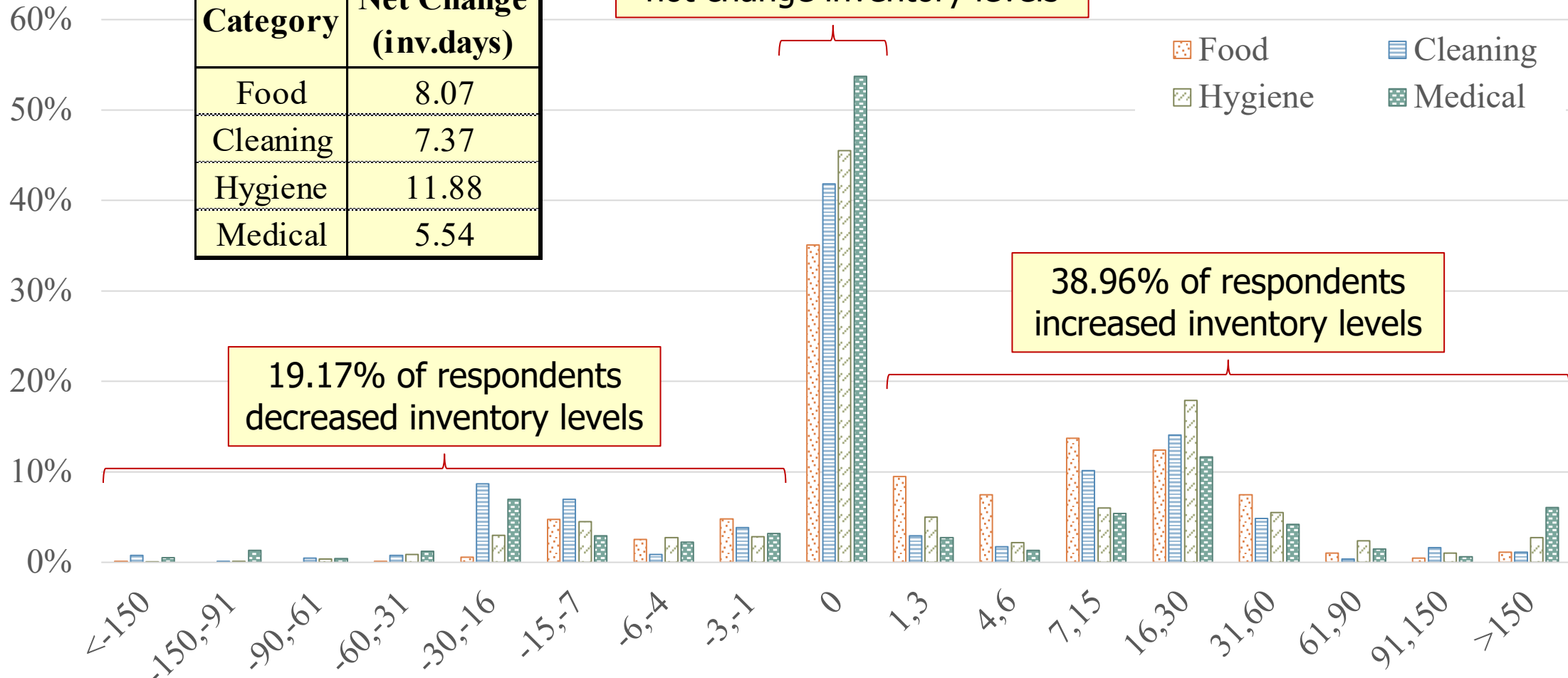
Change in Inventory-Days of Basic Supplies (USA)

Category	Net Change (inv.days)
Food	8.07
Cleaning	7.37
Hygiene	11.88
Medical	5.54

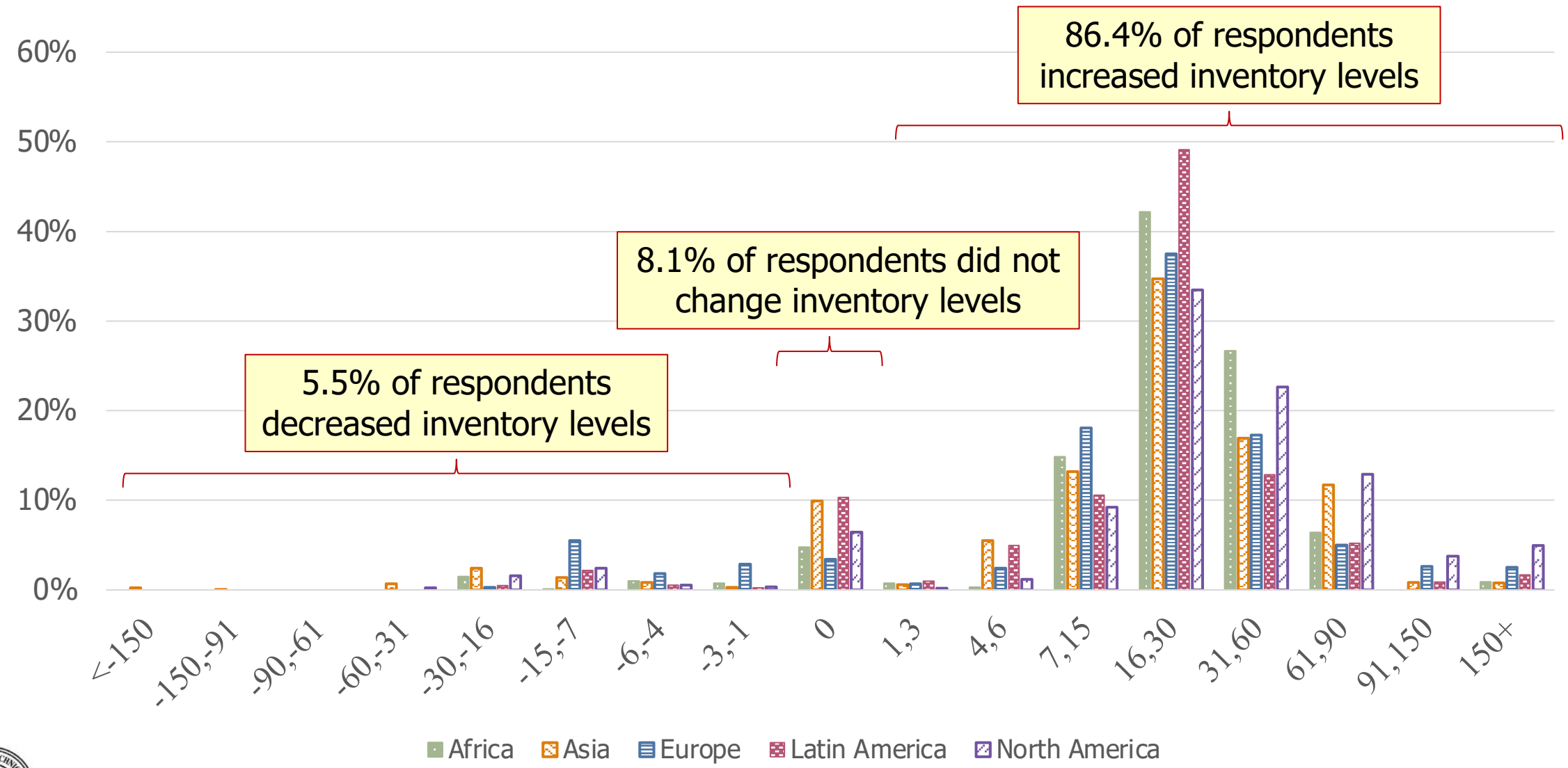
41.87% of respondents did not change inventory levels

38.96% of respondents increased inventory levels

19.17% of respondents decreased inventory levels



Change in Inventory-Days of Basic Supplies (International)



Data-Driven Taxonomy of Reasons

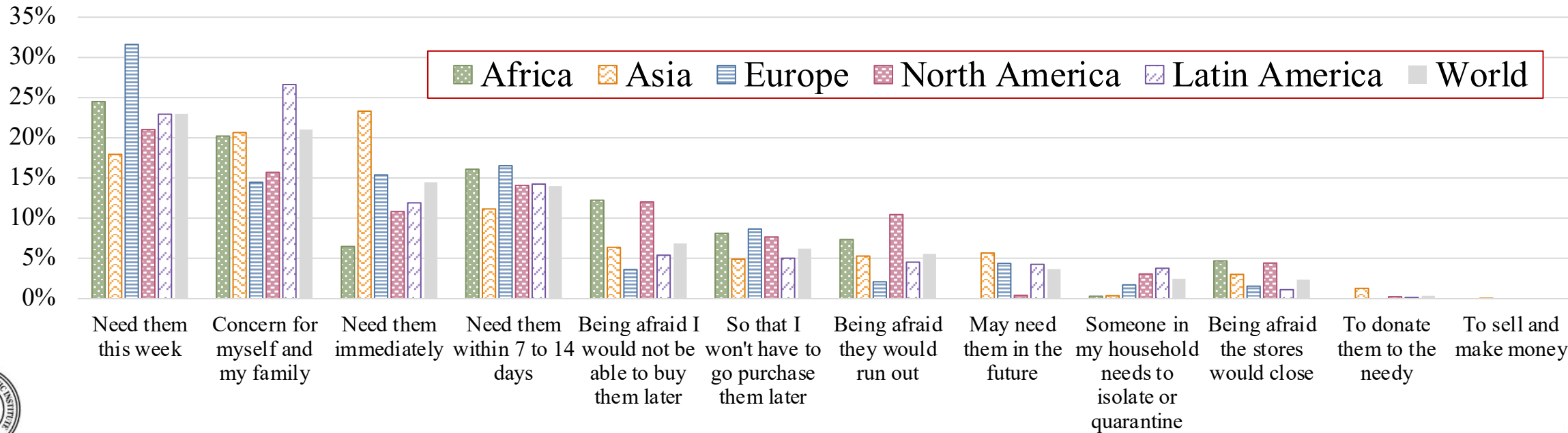
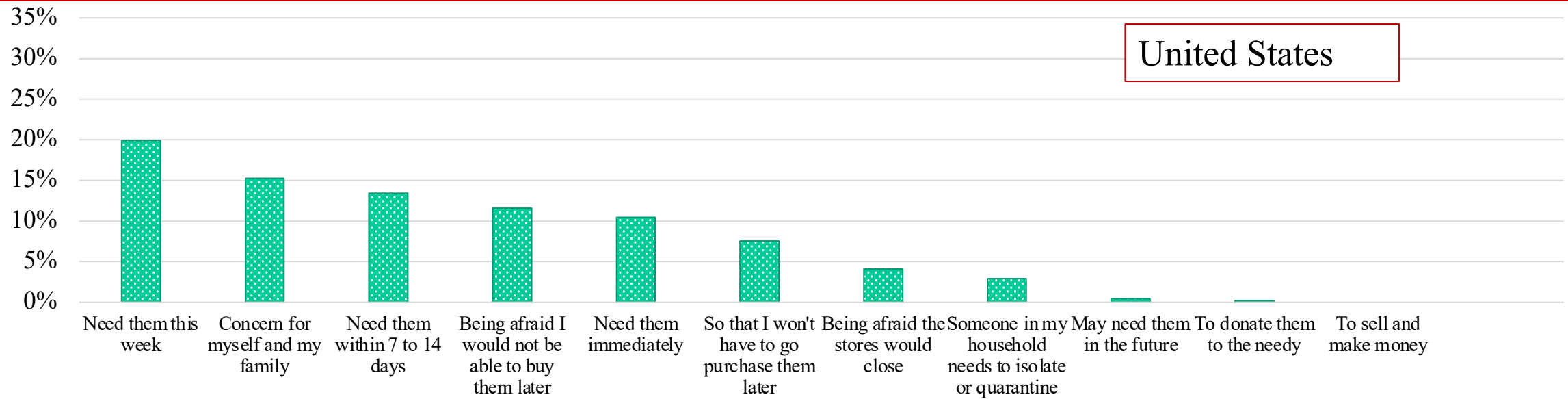


Objectives and Themes of Reasons

- Objectives:
 - *Self-Preservation*, i.e., to ensure the wellbeing of self and family
 - *Altruism*, i.e., to help others outside the family group to cope with supply shortages
 - *Opportunism*, i.e., to take advantage of the crisis to achieve gains (e.g., financial, political, and reputational).
- Themes of Reasons:
 - *Self-Preservation*:
 - Needs Anticipated
 - Regret Avoidance
 - Precaution
 - Convenience
 - COVID-19 Risk Reduction
 - Social Cues
 - Anxiety
 - *Altruism (only one theme)*:
 - Altruism
 - *Opportunism (only one theme)*:
 - *Opportunism*



Most Important Reasons by Region



Comprehensive Management of “Panic Buying”



Possible Ways to Manage Demand

- Rationing:
 - Could produce unintended effects
 - Needs coordination among retailers → typically challenging
 - In most cases, it is implemented too late to have any effect
- Limit purchases:
 - Entails appealing to purchasers to limit their purchases
 - Proactive in nature
- Donations>Returns
 - Entails appealing to purchasers to donate/return “panic bought” supplies
 - Corrective in nature
- Central to the last two approaches is the use of *Trusted Change Agents*, representatives of the relief groups the individual trust the most

Appeals to Limit Purchases: A Proactive Initiative



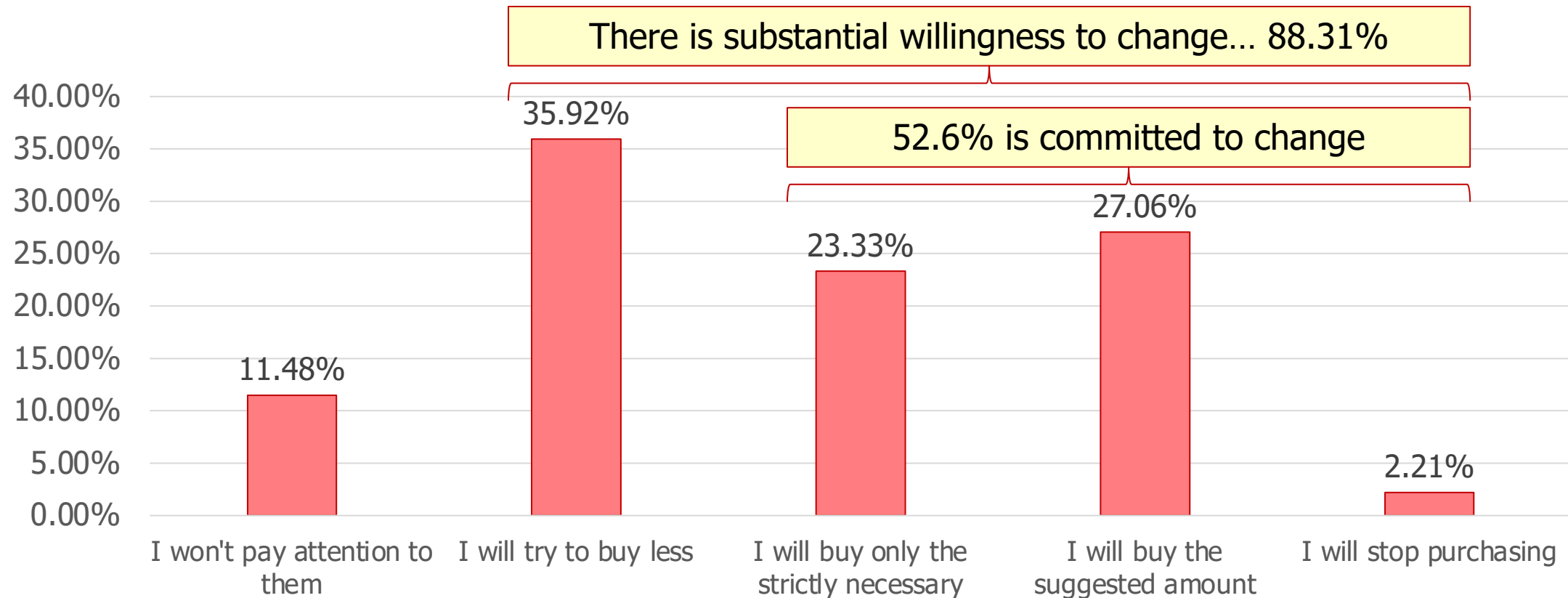
Trusted Change Agents

- *Trusted Change Agents* are the representatives of the relief groups the individual trust the most
- Overall, the top five most trustworthy groups are:
 - Friends / family (33.96%) → Not useful as trusted change agents
 - Red Cross (26.44%)
 - Emergency Responders (26.12%)
 - Firefighters (24.16%)
 - Health Officials (21.78%)
- Different population segments, cultures, and countries have different trusted change agents



Willingness to Change Behavior (for those with TCAs) (USA)

- Would you limit purchases if requested by the group you trust the most?



Depending on the TCA, the percent that would limit their purchases is between 25-35% (preliminary)

Concluding Remarks



Key Findings

- Disaster Related Buying Behaviors (AKA Panic Buying) create tremendous challenges to disaster response, and supply chains
 - Increased demand, creates shortages at the locations that need them the most
 - Led to significant increases in household inventories (5-12 inventory-days)
 - Supply chains cannot match these increases without demand mitigation
- Multiple motivations: Self-Preservation, Altruism, Opportunism
- Respondents are willing to change
 - 52.6% (USA) and 61.6% (World) of respondents are willing to limiting their purchases somewhat, if requested by trusted change agents
 - It may lead to reductions in purchases of 25-35%
 - 56.8% are willing to donate excess supplies (facemasks)
 - It is a corrective action that could foster equity in the access to critical supplies
 - About 15% of the population would donate excess supplies

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Questions? Thanks!

