The Use of Trusted Change Agents to Manage “Panic Buying”: Results from an International Survey

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Outline

- Background
- Research Approach
- Purchasing Patterns (US and International Data)
- Data-Driven Taxonomy of Reasons (US and International Data)
- Comprehensive Management of “Panic Buying”
  - Point-of-Sale Rationing
  - Appeals to Limit Purchases: A Proactive Initiative (US and International Data)
  - Appeals to Donate / Return Excess Supplies: A Corrective Initiative (China Data)
- Priorities for Action
- Concluding Remarks
Background
“We are asking for food, water, medicine, shelter and clothing. Aren’t we humans?”

“We need medicines, something to eat ...”
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

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
Research Approach
The data collection effort followed the spread of the COVID-19 pandemic as it impacted different parts of the world:

- **China**, three different surveys focused on:
  - Purchasing and donations of critical supplies (April-June 2020; 1,565 observations)
  - Purchasing patterns of facemasks (February-March 2020; 1,061 observations)
  - Purchasing patterns of critical supplies (April-May-June, 2020; 574 observations)

- **Europe and the rest of the world**, surveys focused on purchasing patterns of critical supplies (4,608 observations from 20 countries)

- **United States**, surveys focused on purchasing patterns of critical supplies (five waves of about 500 observations, at different stages of the crisis)

- This is the largest effort to collect contemporaneous, and perishable, data about the behavioral roots of DRBBs
Purchasing Patterns: (US and International Data)
DRBBs April/May, June, October 2020 (USA)

- 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

Percent of Respondents (multiple choices allowed)
DRBB Manifestations Across the World (International)

Percent of Respondents (multiple choices allowed)

- **No change**
  - Africa: 20%
  - Asia: 30%
  - Europe: 25%
  - North America: 25%
  - Latin America: 20%

- **More quantity**
  - Africa: 60%
  - Asia: Slightly more than in the US
  - Europe: 50%
  - North America: Slightly less than in the US
  - Latin America: 40%

- **More frequency**
  - Africa: 10%
  - Asia: 20%
  - Europe: 30%
  - North America: 30%
  - Latin America: 25%

- **Change retailers**
  - Africa: 5%
  - Asia: 10%
  - Europe: 10%
  - North America: 5%
  - Latin America: 5%

- **Switch to online**
  - Africa: 15%
  - Asia: 20%
  - Europe: 15%
  - North America: 15%
  - Latin America: 15%
Change in Inventory-Days of Basic Supplies (USA)

- 41.87% of respondents did not change inventory levels
- 38.96% of respondents increased inventory levels
- 19.17% of respondents decreased inventory levels

<table>
<thead>
<tr>
<th>Category</th>
<th>Net Change (inv.days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td>8.07</td>
</tr>
<tr>
<td>Cleaning</td>
<td>7.37</td>
</tr>
<tr>
<td>Hygiene</td>
<td>11.88</td>
</tr>
<tr>
<td>Medical</td>
<td>5.54</td>
</tr>
</tbody>
</table>
Change in Inventory-Days of Basic Supplies (International)

- 86.4% of respondents increased inventory levels
- 5.5% of respondents decreased inventory levels
- 8.1% of respondents did not change inventory levels

Africa, Asia, Europe, Latin America, North America
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
**Reasons Used in Survey #3 (USA)**

- **Self-Preservation:**
  - Regret Avoidance: / I did not want to regret not buying them while I had the opportunity / I was afraid the stores would close/ I was afraid I would not be able to buy them later/ I was afraid they would run out/
  - Need: I will need them this week / I will need them within 7 to 14 days/ I will need them within 15 to 30 days / Someone in my household needs to isolate/ Our area went into a mandated lockdown
  - Precaution: Concern for myself and my family / I may need them in the future/ Possibility of a mandated lockdown/ Saw empty shelves / I stockpile as a normal practice
  - Social Cues: My friends and family were purchasing / Local stores put limits on items sold/ Saw news reports of empty shelves

- **Convenience:** So that I won't have to go purchase them later/ Need to take care of someone and it is difficult to get out

- **COVID-19 Risk:** Changed shopping habits to reduce COVID-19 risk

- **Anxiety mitigation:** It makes me feel better or in control

- **Altruism:**
  - To donate them to the needy / To share with friends and family / To help religious groups / To help groups that advance social or political causes I identify with

- **Opportunism**
  - To sell and make money/ To enhance my/our standing in the community

- **Other (Please specify)**
There is no indication of "panic", or any irrational or unthinking behavior.
Again, there is no indication of “panic”, or any irrational or unthinking behavior
## Breakdown of Reasons (International)

### Self-Preservation

<table>
<thead>
<tr>
<th>Reason</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precaution</td>
<td>Concern for myself and my family</td>
</tr>
<tr>
<td></td>
<td>Need them immediately</td>
</tr>
<tr>
<td>Need Anticipated</td>
<td>Someone in my household needs to isolate or quarantine</td>
</tr>
<tr>
<td></td>
<td>Need them this week</td>
</tr>
<tr>
<td>Regret Avoidance</td>
<td>Being afraid they would run out</td>
</tr>
<tr>
<td>Convenience</td>
<td>So that I won't have to go purchase them later</td>
</tr>
<tr>
<td>Regret Avoidance</td>
<td>Being afraid I would not be able to buy them later</td>
</tr>
<tr>
<td>Need Anticipated</td>
<td>Need them within 7 to 14 days</td>
</tr>
<tr>
<td>Precaution</td>
<td>May need them in the future</td>
</tr>
<tr>
<td>Regret Avoidance</td>
<td>Being afraid the stores would close</td>
</tr>
</tbody>
</table>

### Altruism

<table>
<thead>
<tr>
<th>Reason</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Altruistic</td>
<td>To donate them to the needy</td>
</tr>
</tbody>
</table>

### Opportunism

<table>
<thead>
<tr>
<th>Reason</th>
<th>Importance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opportunistic</td>
<td>To sell and make money</td>
</tr>
</tbody>
</table>

Legend:
- **Very Important**
- **Important**
- **Moderately Important**
- **Slightly Important**
- **Not Important**
Most Important Reasons by Region

USA

- Need them this week
- Concern for myself and my family
- Need them within 7 to 14 days
- Being afraid I would not be able to buy them later
- Need them immediately
- So that I won't have to go purchase them later
- Being afraid the stores would close
- Someone in my household needs to isolate or quarantine
- May need them in the future
- To donate them to the needy
- To sell and make money

Africa
- Asia
- Europe
- North America
- Latin America
- World
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 these approaches is the use of *Trusted Change Agents*, representatives of the relief groups the individual trust the most.
Point-of-Sale Rationing
Rationing: The Good, The Bad, and The Ugly

- The Good:
  - Relatively easy to implement

- The Bad:
  - The private sector’s natural inclination is to avoid rationing altogether
  - Implement rationing as a measure of last resort for the shortest possible time
  - Although beneficial, it typically comes too late to prevent the shortages

- The Ugly:
  - Rationing must be coordinated with disaster relief agencies and retailers
    - Coordination is needed to prevent free-riders and opportunists
    - Coordination requires cooperation and a supportive legal framework
  - Public-Private Agreements to transfer critical supplies to disaster agencies are key
Trusted Change Agents (TCAs)
Changes in behavior require external stimuli

Trusted Change Agents (TCAs) are “...the agents deemed by respondents as trustworthy and knowledgeable of disaster conditions...”

The main focus is on TCAs that could be engaged in a strategy of behavior change, i.e., that could be trained / convinced to play a beneficial role

“Friends and Family”, undoubtedly influential, are not good candidates for TCAs as they may share the same beliefs as the target individuals (convincing “Friends and Family” is as difficult as convincing the target individuals)

Our previous research found that TCAs could be very effective in inducing behavior changes
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?

There is substantial willingness to change... 88.31%

52.6% is committed to change

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

61.6% is committed to change

- Africa
- Asia
- Europe
- North America
- Latin America
- World

Options:
- I will stop purchasing
- I will buy only the strictly necessary
- I will buy the suggested amount
- I will try to buy less
- I won't pay attention to them
Appeals to Donate / Return Excess Supplies:
A Corrective Initiative (Data from China)
Overview of Facemasks Supplies Shortages (China)

- The National Health Commission confirmed that the coronavirus spread from human to human on January 20, 2020
- People rushed to buy PPE, particularly facemasks
- Widespread shortages
- Some retailers imposed restrictions
- Consumers turned their sights to overseas markets
- Shortages impacted frontline medical workers
- The production capacity was lower

https://www.philstar.com/headlines/2020/02/01/1989512/5-chinese-arrested-mask-overprice
Purchasing Patterns
Breakdown of Facemasks Purchased

- Survey deployed on February 24, 2020 in China: 1,061 observations
- The average purchase was 65 facemasks/person

<table>
<thead>
<tr>
<th>Type of action</th>
<th>Purchase quantity (pieces)</th>
<th>Percentage of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bought</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1-20</td>
<td>16.7%</td>
<td></td>
</tr>
<tr>
<td>21-50</td>
<td>17.5%</td>
<td></td>
</tr>
<tr>
<td>51-100</td>
<td>13.2%</td>
<td></td>
</tr>
<tr>
<td>101-200</td>
<td>4.5%</td>
<td></td>
</tr>
<tr>
<td>201-300</td>
<td>1.2%</td>
<td></td>
</tr>
<tr>
<td>301-500</td>
<td>0.4%</td>
<td></td>
</tr>
<tr>
<td>&gt;500</td>
<td>0.9%</td>
<td></td>
</tr>
<tr>
<td>Could not buy (stockout)</td>
<td>0</td>
<td>32.7%</td>
</tr>
<tr>
<td>Did not try to buy</td>
<td>N.A.</td>
<td>13.0%</td>
</tr>
</tbody>
</table>

A third of the respondents failed to buy facemasks because of the shortages
Willingness to Donate Excess Facemasks
The survey asked respondents if they were willing to donate excess facemasks. 56.8% of the individuals who had purchased excess facemasks stated they would be willing to donate them to others. → 14.5% of the population would donate excess supplies to the needy.
Priorities for Action
Strategy

- **Demand Management:**
  - 1<sup>st</sup>: Appeal to consumers to limit purchases
  - 2<sup>nd</sup>: Appeal to consumers to donate/return excess purchases
    - Influence large numbers of individuals and significantly increase inventory-days
    - Are “easy to address”
  - 3<sup>rd</sup>: Ration critical supplies

- **Key Insight:** To limit self-preservation purchases, focus on the most promising targets. To do so, the authors:
  - Calculated the increases in inventory-days associated with the reason
  - Used econometrics, and the percent of respondents that identified the reason as “very important” to identify how influential the reasons are
  - Qualitatively assessed the extent to which a trigger reason is “addressable”
  - Qualitatively identified the most promising “targets”
# Self Preservation Purchases

**1st Priority:** These reasons are influential, affect large amounts of purchases, and are “addressable”

**Priority #1: Regret Avoidance**

<table>
<thead>
<tr>
<th>Reason</th>
<th>% Cases</th>
<th>Factor Loading</th>
<th>Increase in inv.-days (*)</th>
<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Afraid I will be not able to buy them later</td>
<td>7.03%</td>
<td>0.819</td>
<td>Very High</td>
<td>Addressable</td>
<td>Very High</td>
</tr>
<tr>
<td>Afraid they would run out / prices increase</td>
<td>6.04%</td>
<td>0.805</td>
<td>High</td>
<td>Addressable</td>
<td>Very High</td>
</tr>
<tr>
<td>Being afraid stores would close</td>
<td>4.12%</td>
<td>0.746</td>
<td>Medium</td>
<td>Addressable</td>
<td>High</td>
</tr>
</tbody>
</table>

**Priority #2: Precaution**

<table>
<thead>
<tr>
<th>Reason</th>
<th>% Cases</th>
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<th>Increase in inv.-days (*)</th>
<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>May need them in the future</td>
<td>5.87%</td>
<td>0.799</td>
<td>Very High</td>
<td>Addressable</td>
<td>Very High</td>
</tr>
<tr>
<td>Possibility of mandated lockdown</td>
<td>4.45%</td>
<td>0.738</td>
<td>Medium</td>
<td>Addressable</td>
<td>Very High</td>
</tr>
<tr>
<td>Saw empty shelves in stores</td>
<td>6.96%</td>
<td>0.725</td>
<td>High</td>
<td>Hard</td>
<td>Medium</td>
</tr>
<tr>
<td>Concern for me and my family</td>
<td>7.85%</td>
<td>0.651</td>
<td>High</td>
<td>Addressable</td>
<td>Medium</td>
</tr>
<tr>
<td>Stockpile as a normal practice</td>
<td>1.91%</td>
<td>0.535</td>
<td>Medium</td>
<td>Hard</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Priority #3: Convenience**

<table>
<thead>
<tr>
<th>Reason</th>
<th>% Cases</th>
<th>Factor Loading</th>
<th>Increase in inv.-days (*)</th>
<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>I won’t have to go purchase them later</td>
<td>2.86%</td>
<td>0.791</td>
<td>Medium</td>
<td>Addressable</td>
<td>Medium</td>
</tr>
<tr>
<td>Need to care for someone… difficult</td>
<td>3.66%</td>
<td>0.7</td>
<td>Low</td>
<td>Very Hard</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Priority #4: Social Cues**

<table>
<thead>
<tr>
<th>Reason</th>
<th>% Cases</th>
<th>Factor Loading</th>
<th>Increase in inv.-days (*)</th>
<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw news reports of empty shelves</td>
<td>6.25%</td>
<td>0.855</td>
<td>Medium</td>
<td>Hard</td>
<td>Low</td>
</tr>
<tr>
<td>Local stores put limits on quantities sold</td>
<td>6.50%</td>
<td>0.787</td>
<td>High</td>
<td>Hard</td>
<td>Medium</td>
</tr>
<tr>
<td>My friends and family were stockpiling</td>
<td>1.34%</td>
<td>0.771</td>
<td>Medium</td>
<td>Hard</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Priority #5: Need Anticipated**

<table>
<thead>
<tr>
<th>Reason</th>
<th>% Cases</th>
<th>Factor Loading</th>
<th>Increase in inv.-days (*)</th>
<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Need them within 7-14 days</td>
<td>4.49%</td>
<td>0.772</td>
<td>Very High</td>
<td>Very Hard</td>
<td>Medium</td>
</tr>
<tr>
<td>Need them within 15-30 days</td>
<td>3.25%</td>
<td>0.732</td>
<td>Very High</td>
<td>Very Hard</td>
<td>Medium</td>
</tr>
<tr>
<td>Need then this week</td>
<td>8.03%</td>
<td>0.622</td>
<td>Medium</td>
<td>Very Hard</td>
<td>Low</td>
</tr>
<tr>
<td>Our area went into a lockdown</td>
<td>4.73%</td>
<td>0.508</td>
<td>Medium</td>
<td>Very Hard</td>
<td>Low</td>
</tr>
<tr>
<td>Someone needs isolate or quarantine</td>
<td>3.23%</td>
<td>0.473</td>
<td>Low</td>
<td>Very Hard</td>
<td>Low</td>
</tr>
</tbody>
</table>

**Priority #6: Risk Reduction**

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<thead>
<tr>
<th>Reason</th>
<th>% Cases</th>
<th>Factor Loading</th>
<th>Increase in inv.-days (*)</th>
<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>To reduce risk of getting COVID</td>
<td>7.07%</td>
<td>1</td>
<td>Very High</td>
<td>Very Hard</td>
<td>Medium</td>
</tr>
</tbody>
</table>

**Priority #7: Anxiety**

<table>
<thead>
<tr>
<th>Reason</th>
<th>% Cases</th>
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<th>Increase in inv.-days (*)</th>
<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>It makes me feel better or in control</td>
<td>4.39%</td>
<td>1</td>
<td>High</td>
<td>Very Hard</td>
<td>Low</td>
</tr>
</tbody>
</table>

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**Themes and Motivating Reasons**

<table>
<thead>
<tr>
<th>% Cases</th>
<th>Factor Loading</th>
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<th>Ease of Address</th>
<th>Potential Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loading</td>
<td>Increase in inv.-days (*)</td>
<td>Ease of</td>
<td>Potential</td>
<td></td>
</tr>
</tbody>
</table>

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**Potential Impact**

- High
- Medium
- Low

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(*) Increase in inv.-days refers to the impact on inventory days due to increased demand. This metric helps in understanding the strain on supply chains and the need for strategic planning and allocation of resources.
### Altruistic Purchases

- Generally beneficial, if the articles purchased are needed
- However, they add to the “unsolicited donations” problem, and should be encouraged to donate cash instead

> The New York Times

**Georgia Businessman Charged With Hoarding Face Masks and Price Gouging**

The man, Milton Ayimadu, allegedly hoarded 200,000 face masks and sold them for double what he paid, according to the U.S. Attorney’s Office.

### Opportunistic Purchases

- Reputational, Political:
  - As in the case of Altruistic purchases, generally beneficial, if the articles purchased are actually needed, and the donor has already identified groups that are willing to take the donation
  - They add to the “unsolicited donations” problem, donating cash is better

- Financial
  - Case I: Businesses that are satisfying the needs of their consumers, at reasonable prices, contribute to economic welfare
  - Case II: Businesses that exploit the crisis to exercise arbitrage and “price-gouging” must be vigorously curtailed
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
What Could Be Done?

- Use Demand Management:
  - Engage trusted agents to:
    - Limit Self-Preservation purchases (25-35% of population would do it)
      - 52.6% (61.6% world) of respondents are “committed” to limiting purchases
        - Aim efforts at reasons related to Regret Avoidance, Precaution, Convenience
        - Appeal to citizens to do what is right...
        - Engage local responders, relief groups... health officials...
    - Encourage donations/returns of excess supplies (15% of population would do it)
  - Engage retailers to ration critical supplies in a coordinated manner

- Use all the power of the law to fight hoarding and price gouging

- Establish Public-Private Collaboration Agreements
  - To be activated in case of disasters of a certain size, companies in possession of critical supplies agree to sell them to the emergency response agencies
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