

Mapping shortage preparation strategy to nature of the shock

Trigger type	Shock characterization	Appropriate strategy
Pandemics and CBRN* threats	<ul style="list-style-type: none"> Primarily a demand shock For some triggers, drugs at risk of shortage are known For some triggers, drugs, tests, or vaccines may not exist 	<ul style="list-style-type: none"> Early detection and containment mechanisms are important For buffering against medical countermeasures, key decision is how much to stockpile versus use other buffering strategies like holding excess capacity For buffering against new pathogens, need infrastructure to develop vaccines, drugs, and tests, scale up production quickly, and get it to patients quickly
Natural disasters	<ul style="list-style-type: none"> Supply disruption of varying strength Can affect any part of the supply chain Vulnerability can be assessed 	<ul style="list-style-type: none"> In the short term, buffering is the primary option (stockpiling, diversification, excess capacity) In the short term, vulnerability to natural disasters can be assessed In the long term, can prepare by strategically selecting where facilities are located, how they are constructed, where inventory is stored
Manufacturing quality	<ul style="list-style-type: none"> Most common in final stage of generic sterile injectable production Most production is in the U.S. and Europe These shortages have economic underpinnings 	<ul style="list-style-type: none"> Buffering strategies can help but key to address the root cause of quality lapses because otherwise product not made to specification may reach patients, causing harm Markets currently do not allow generic manufacturers to differentiate themselves on reliability of supply Policy solutions must shift hospital buying behavior away from heavy emphasis on price towards reliability For outpatient multiple source generic injectables, need to eliminate Medicaid inflation rebates, which currently do not allow manufacturers to pass on legitimate cost increases
Geopolitical risk	<ul style="list-style-type: none"> Not a current trigger but a possible one Greater exposure for upstream supply chains Would be a supply disruption, potentially long-term and widespread 	<ul style="list-style-type: none"> A strategic approach is necessary because of the sheer size of potential disruption: <ul style="list-style-type: none"> Need to revise the essential medicines list Need better analytics to identify vulnerabilities Must consider full supply chains Need to consider common links between drugs For priority supply chains, lower risk though diversification, selective onshoring, otherwise friend-shoring For priority supply chains with much geopolitical risk exposure, apply buffering strategies When onshoring, address the possibility of other shock types

*CBRN stands for chemical, biological, radiological, and nuclear