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What Mumbai needs to learn from superstorm Sandy

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*Mumbai*

The rising number of cyclones in the Arabian Sea put the low-lying city at risk. Emergency planning is crucial.

Try typing "Bombay cyclone of 1882" into your favorite search engine. You will learn that on June 6, 1882, the city of Bom bay was struck by a cyclone so severe that 100,000 people one eighth of the population of the city at the time -were killed. There are many mentions of this storm in reputable books, newspaper articles, and online sources.

But you can't believe everything you read on the internet. As far as I can tell, the Bombay cyclone of 1882 didn't really happen. I have consulted a large group of meteorologists and cyclone experts, a couple of historians, and primary written sources from the time. None of the experts knows anything about this storm, nor have either they or I been able to find any

direct accounts of it.

I don't know where this apparently fictional account started. But perhaps the reason it has survived and propagated through so many modern accounts is that, at least in its broad outlines, it is a plausible scenario. It didn't happen in 1882, but something like it could have happened. It still could today, and the odds are likely increasing.

Many of the worst natural disasters in history have occurred when tropical cyclones have made landfall in low-lying and densely populated coastal regions. Often, the real killer is not the winds, but the storm surge (the temporary rise in sea level

created as the winds push the ocean water onto the shore). If the conditions are right a wave of water, coming on fast like a tsunami in some cases - can submerge buildings, roads, people, and everything else in its path. Death tolls can be enormous. In the very worst cases -most recently, Bangladesh in 1970 and 1991, and Myanmar in 2008 hundreds of thousands of people have been killed by single storms.

Mumbai's low-lying geography would put it at great risk for an event like this, if an intense cyclone were to strike from the Arabian Sea.

While several cyclones did strike the city during the 17th, 18th, and 19th centuries, Mumbai's more recent history has not seen a significant cyclone landfall. But recent history is not an adequate guide to the future where extreme weather events are concerned. Just ask any resident of New York City , where I live.

Before "Superstorm" Sandy flooded our city three years ago, the last time there had been a storm surge of Sandy's magnitude in New York harbor was 1821. The city was a different place back then. The population then was 150,000 compared to today's 8 million. There were no subway tunnels to flood, no electric power to go out. The 1821 storm was well within our recorded history, but it didn't have a significant influence on the subsequent planning and development of our infrastructure, let alone the psyches of the residents.

It was known, though, that a catastrophic storm surge could happen here. The 20th and early 21st centuries had seen a number of major hurricane strikes on the northeast US coast - and some winter storms that were almost as bad. None had caused a major disaster for New York City , but some had come close. Well aware that it could be different next time, officials at the local, state, and federal levels had worked with scientists for decades, producing studies to understand the vulnerability of the city and the surrounding region to flooding from the sea. As a result, we knew not only that it could happen, but also what most of the consequences would be.

Plans were developed for evacuating people from the most low-lying neighborhoods, closing the transit system, and taking other emergency measures to protect life and property. These measures were implemented first when Hurricane Irene hit in 2011, and then for Sandy just one year later.

