



7th IAA Planetary Defense Conference

26-30 April 2021, Online Event

Hosted by UNOOSA in collaboration with ESA

Engaging the audience – what can we learn from them?

Alex KARL

IAF Technical Committee on NEOs

IAA-PDC-21-12-05

Get ready to protect Earth from asteroids – Planetary Defense in your hands, SpS IAC 2019



- Bill Nye
- Lindley Johnson
- Dorin Prunariu
- Mariella Graziano
- Alex Karl

Engaging the audience

- 200-250 people
- ~60 poll participants
- 40 questions received, 90 upvotes
- 2019 PDC Hypothetical Asteroid Impact Scenario
- 5 scenarios + polls
- Poll limitations



Exercise Inject#1: Oct 21, 2019: NEWLY DISCOVERED ASTEROID POSES SMALL RISK OF EARTH IMPACT

- small chance (1%) of asteroid impacting our planet 8 years from now.
- Size estimate: 100-300m

Multiple-choice poll



Poll#1: What is your reaction?

041

A: 1% and 8 years? Nothing to worry about.

2 %

B: Let's wait. Once we know if and where it will hit, there's plenty of time to react if needed.

5 %

C: Just in case, let's get ready. Better safe than sorry.

76 %

D: I'm really worried and losing sleep - we need to act now!

17 %



Exercise Inject#2: Jan 21, 2020: ASTEROID NOW HAS 1 IN 10 CHANCE TO IMPACT EARTH

- 10% chance of asteroid impacting our planet ~7.5 years from now.
- Size estimate: 140-260m (could produce serious devastation over a large region but too small to cause globally damaging effects)
- SMPAG calls meeting

Multiple-choice poll



Poll#2: What is your reaction?

059

A: 10% and 7 years, 9 months? Still nothing to worry about.

5 %

B: Let's wait until we know if and where it will hit and base our response on that. There is plenty of time.

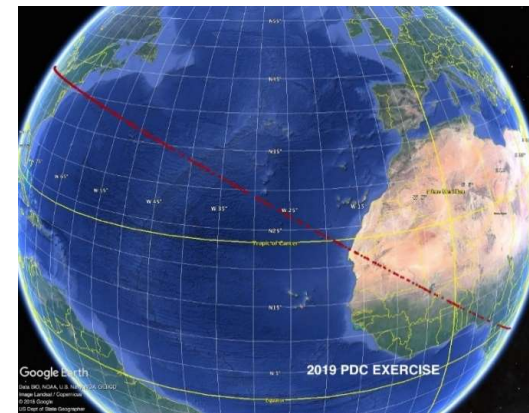
2 %

C: Let's get ready and prepare for the worst. Better safe than sorry.

51 %

D: I'm really worried and losing sleep - we need to act now!

42 %



Exercise Inject#3: Jun 21, 2022: ASTEROID PREDICTED TO IMPACT NEAR DENVER, COLORADO ON OCTOBER 21, 2027: EFFORTS TO PREVENT IMPACT ACCELERATE

- 100% chance of asteroid impacting ~5 years from now.
- Contact binary, 140-220 m. The asteroid is large enough to cause major damage over a large region around the Denver area.
- Fleet of 6 kinetic impactors will need to be build and launched by space agencies as well as two rendezvous spacecraft to gather data on asteroid

Multiple-choice poll



Poll#3: What do you think about the plans to deflect the asteroid?

061

A: We should do nothing, as I don't think it will work and will just waste resources

3 %

B: We should rather prepare Denver for impact than risking to fail and ending up in a new situation with less time

5 %

C: We need to act but must make sure we are ready for all possible outcomes

62 %

D: It is our responsibility to act when we can prevent disaster no matter what

30 %



Exercise Inject#4: Feb 23, 2025: DEFLECTION PARTIALLY SUCCESSFUL BUT LARGE FRAGMENT REMAINS ON IMPACT TRAJECTORY, U.S. IMPACT STILL POSSIBLE

- 3 kinetic impactors were successful in deflection main body but large piece broke off, still on course
- Fragment estimated to be 50-80 m. Exact location not yet known exactly
- No active spacecraft left from original fleet
- SMPAG and UN considering to launch nuclear device for deflection

Multiple-choice poll



Poll#4: Now what?

066

A: Space is hard, let's try again and send the nuke



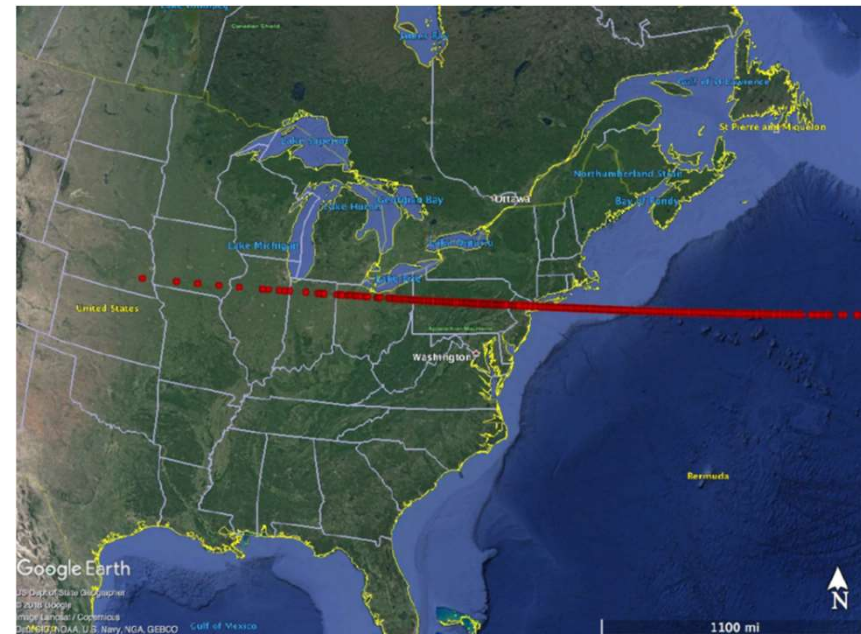
B: They failed, my trust in NASA and the other space agencies is gone



C: The nuke is too risky, there must be another option for deflection



D: Too late for deflection, we must prepare for impact



Exercise Inject#5: Oct 11, 2027: SMALL ASTEROID TO IMPACT OVER NEW YORK CITY IN 10 DAYS

- 60m fragment to hit NY Central Park
- It was too late to launch NED
- FEMA evacuating residents and preparing infrastructure

Multiple-choice poll



Poll#5: What do you think we need to work on most urgently?

066

A: Our detection capability



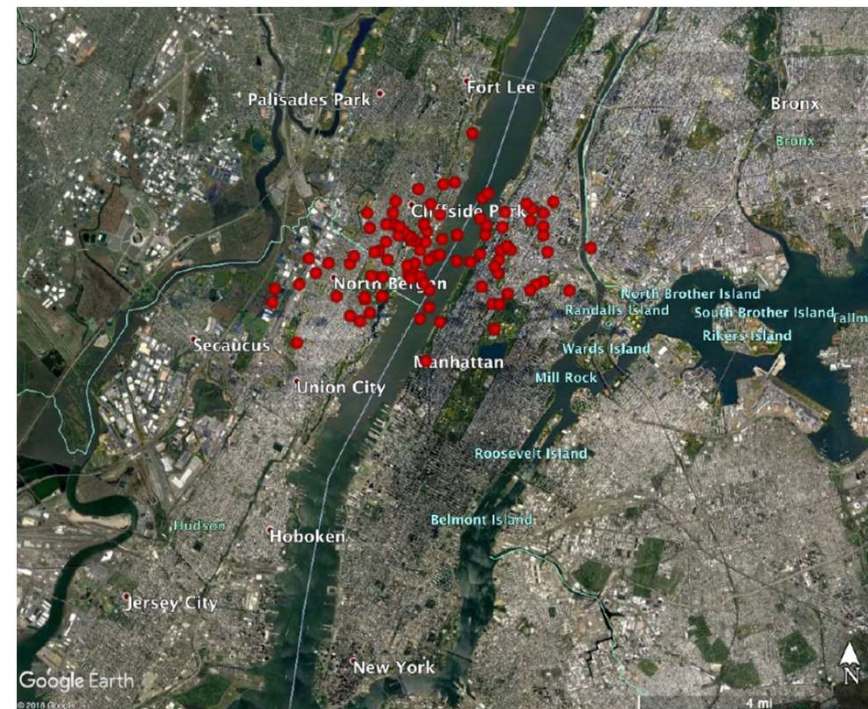
B: Establishing geopolitical agreements



C: Our deflection capabilities



D: Communication with the public



Conclusions

- A vast majority (~90%) of the audience is in favour of being prepared and taking action.
- Risk perception needs to be taken into account when communicating to the public. (a change from 1% to 10% impact probability leads to additional 25% of audience to get worried)
- The potential effects of warnings on mental health should be considered and addressed. (40% of the people start to worry and are losing sleep almost 8 years ahead of an event that is very likely (90%) not going to happen)
- The use of NEDs is controversial (47% – 53%).
- More than half of the audience thinks communication with the public is the most urgent matter to work on for the planetary defense community.
- Polls are a good way to engage audience, received lots of positive feedback