We Need the Discipline of Cyber Public Health

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On 16 November 2020, I <u>gave</u> a Distinguished Lecture at Ruhr University Bochum. A video of is at https://www.youtube.com/watch?v=2PobV1jH4a8, and I wanted to share the references.

Acknowledgements

Amongst other things, Cormac Herley pointed out that assertions that we need "something," (such as a discipline of cyber health) often fall into the politician's fallacy of "we need something, this is something, thus we need this". I acknowledge his point, and assert I needed a snappy title. I am also grateful to Loren Kohnfelder, Steven Lipner, Michelle Mazurek, Paul Van Oorschot, Fred Schneider, Andrew Stewart, and Mary Ellen Zurko for helpful feedback and commentary.

Informal Reference List

Many references in this list are not directly mentioned in the lecture.

Acar, Y., Backes, M., Fahl, S., Garfinkel, S., Kim, D., Mazurek, M. L., & Stransky, C. (2017). Comparing the Usability of Cryptographic APIs. *Proceedings - IEEE Symposium on Security and Privacy*, 154–171. https://doi.org/10.1109/SP.2017.52

Bair, Jonathan and Bellovin, Steven M. and Manley, Andrew and Reid, Blake E. and Shostack, Adam, "That Was Close! Reward Reporting of Cybersecurity 'Near Misses'" Feb 22, 2018). Colorado Technology Law Journal 16.2. http://ctlj.colorado.edu/?page_id=796#tabs-796-0-5

Bellman, C., & van Oorschot, P. C. (2020). Best Practices for IoT Security: What Does That Even Mean?. *arXiv preprint arXiv:2004.12179*.

Geoffrey C. Bowker and Susan Leigh Star, *Sorting Things Out: Classification and Its Consequences*, MIT Press (1999)

Lauren Caruba, Under court order, San Antonio man confined for mandatory treatment of tuberculosis, San Antoinio Express News, April 10, 2019
https://www.expressnews.com/news/local/article/Under-court-order-San-Antonio-man-confined-for-13758117.php

The CDC Foundation, "What is Public Health?" https://www.cdcfoundation.org/what-public-health, last visited June 6, 2020

Cimpanu, C. Chrome: 70% of all security bugs are memory safety issues. May 23, 2020 *ZDNet*. https://www.zdnet.com/article/chrome-70-of-all-security-bugs-are-memory-safety-issues/

CISA "What does CISA do" https://www.cisa.gov/ last visited June 20, 2020

Coronaviruses Overview, National Institute of Allergy and Infectious Diseases, version of May 19, 2020. https://www.niaid.nih.gov/diseases-conditions/coronaviruses

Council of State and Territorial Epidemiologists, Standardized surveillance case definition and national notification for 2019 novel coronavirus disease (COVID-19), Interim-20-ID-01, undated. https://cdn.ymaws.com/www.cste.org/resource/resmgr/2020ps/interim-20-id-01 covid-19.pdf Last visited 10 June, 2020.

Cyberspace Policy Review: Assuring a Trusted and Resilient Information and Communications Infrastructure, Federal Communications Commission, April 30, 2013 https://fas.org/irp/eprint/cyber-review.pdf

George Danezis, Security Engineering: What Works, Post to Conspicuous Chatter blog, December 18, 2014, https://conspicuouschatter.wordpress.com/2014/12/18/security-engineering-what-works/

The viral universe Viruses have big impacts on ecology and evolution as well as human health. (2020, August). *The Economist*, 1–22. https://www.economist.com/essay/2020/08/20/viruses-have-big-impacts-on-ecology-and-evolution-as-well-as-human-health

ENISA, About ENISA, https://www.enisa.europa.eu/about-enisa last visited June 20, 2020,

Food and Drug Administration, Questions and Answers on Dietary Supplements, July 22, 2020 https://www.fda.gov/food/information-consumers-using-dietary-supplements/questions-and-answers-dietary-supplements

Hill, R. K. (2020). Protecting computers and people from viruses. In *Communications of the ACM* (Vol. 63, Issue 10, pp. 8–9). Association for Computing Machinery. https://doi.org/10.1145/3415748

Brad Duncan, Job application-themed malspam pushes Z Loader, Internet Storm Center Blog, June 10, 2020

 $\frac{https://isc.sans.edu/forums/diary/Job+applicationthemed+malspam+pushes+ZLoader/2622}{2/}$

Iulia Ion, Rob Reeder, and Sunny Consolvo. 2015. "...No one can hack my mind": comparing expert and non-expert security practices. In Proceedings of the Eleventh USENIX Conference on Usable Privacy and Security (SOUPS '15). USENIX Association, USA, 327–346. And image from https://security.googleblog.com/2015/07/new-research-comparing-how-security.html

Diana Freed, Jackeline Palmer, Diana Minchala, Karen Levy, Thomas Ristenpart, and Nicola Dell. 2018. "A Stalker's Paradise": How Intimate Partner Abusers Exploit Technology. In Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems (CHI '18). Association for Computing Machinery, New York, NY, USA, Paper 667, 1–13. https://doi.org/10.1145/3173574.3174241

Johnson, Steven Berlin, *The Ghost Map*, The Story of London's Most Terrifying Epidemic-and How It Changed Science, Cities, and the Modern World. New York: Riverhead Books, 2006.

M.E. Kabay, Robin Borough & Radana Dvorak, A Medical Model for Information Assurance & IT Resillience (unpublished draft, 2016)

Kahneman, D. (2011). Thinking, fast and slow. Macmillan.

Timothy Kelley, and L. Jean Camp. "Online promiscuity: Prophylactic patching and the spread of computer transmitted infections." *The Economics of Information Security and Privacy*. Springer, Berlin, Heidelberg, 2013. 157-180.

Fanny Lalonde Lévesque, Sonia Chiasson, Anil Somayaji, and José M. Fernandez. 2018. Technological and Human Factors of Malware Attacks: A Computer Security Clinical Trial Approach. ACM Trans. Priv. Secur. 21, 4, Article 18 (July 2018), 30 pages. https://doi.org/10.1145/3210311

Herb Lin, Cybersecurity Lessons From the Pandemic, or Pandemic Lessons From Cybersecurity, Lawfare Blog, June 2, 2020, https://www.lawfareblog.com/cybersecurity-lessons-pandemic-or-pandemic-lessons-cybersecurity

Steven B. Lipner, (2015). The Birth and Death of the Orange Book. *IEEE Annals of the History of Computing*, 37(2), 19–31. https://doi.org/10.1109/MAHC.2015.27

Majority staff of the committee on transportation and Infrastructure,. *THE DESIGN*, *DEVELOPMENT & CERTIFICATION OF THE BOEING 737 MAX* (2020). https://transportation.house.gov/imo/media/doc/2020.09.15 FINAL 737 MAX Report for Public Release.pdf

McAfee, McAfee Potentially Unwanted Programs (PUP) Policy, March 2018 https://www.mcafee.com/enterprise/en-us/assets/misc/ms-pup-policy.pdf

Deirdre K. Mulligan and Fred B. Schneider, Doctrine for Cybersecurity, Daedalus. Fall 2011, 70—92.

Daniel B. Prieto and Steven Bucci, Meeting the Cybersecurity Challenge: Empowering Stakeholders and Ensuring Coordination, IBM U.S. Federal White Paper – February 2010

Michael Raggi, Dennis Schwarz, and Georgi Mladenov, TA410: The Group Behind LookBack Attacks Against U.S. Utilities Sector Returns with New Malware, Proofpoint blog, June 8, 2020 https://www.proofpoint.com/us/blog/threat-insight/ta410-group-behind-lookback-attacks-against-us-utilities-sector-returns-new

Beth Reinhard, Emma Brown, Reis Thebault and Lena H. Sun, CDC wants states to count 'probable' coronavirus cases and deaths, but most aren't doing it, The Washington Post, June 8, 2020 https://www.washingtonpost.com/investigations/cdc-wants-states-to-count-probable-coronavirus-cases-and-deaths-but-most-arent-doing-it/2020/06/07/4aac9a58-9d0a-11ea-b60c-3be060a4f8e1_story.html

Rowe, Brent & Halpern, Michael & Lentz, Tony. (2012). Towards the Realization of A Public Health System for Shared Secure Cyber-Space. Cross Talk: The Journal of Defense Software Engineering. 25. 30.

Sedenberg, E., & Mulligan, D. (2016). Public Health as a Model for Cybersecurity Information Sharing. *Berkeley Technology Law Journal*, *30*(3), 1687–1740. https://doi.org/http://dx.doi.org/10.15779/Z38PZ61

Stajano, Frank, Towards greater ecological validity in security usability, Light Blue Touchpaper blog, 26 June 2020, https://www.lightbluetouchpaper.org/2020/06/26/towards-greater-ecological-validity-in-security-usability/

VirusTotal Results page for various hashes (in URLs)

 $\frac{https://www.virustotal.com/gui/file/aa8fc19f16e4e185f6464d2e18ec7731c235d2b0d364f7696}{5cf5967d5eef613/detection}$

 $\frac{https://www.virustotal.com/gui/file/aa8fc19f16e4e185f6464d2e18ec7731c235d2b0d364f7696}{5cf5967d5eef613/detection}$

(Last visited June 13, 2020)

Zittrain, J. (2019). Three Eras of Digital Governance. SSRN Electronic Journal. https://doi.org/10.2139/ssrn.3458435