DNS abuse mitigation in the gTLD context

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Domain Abuse Activity Reporting (DAAR)

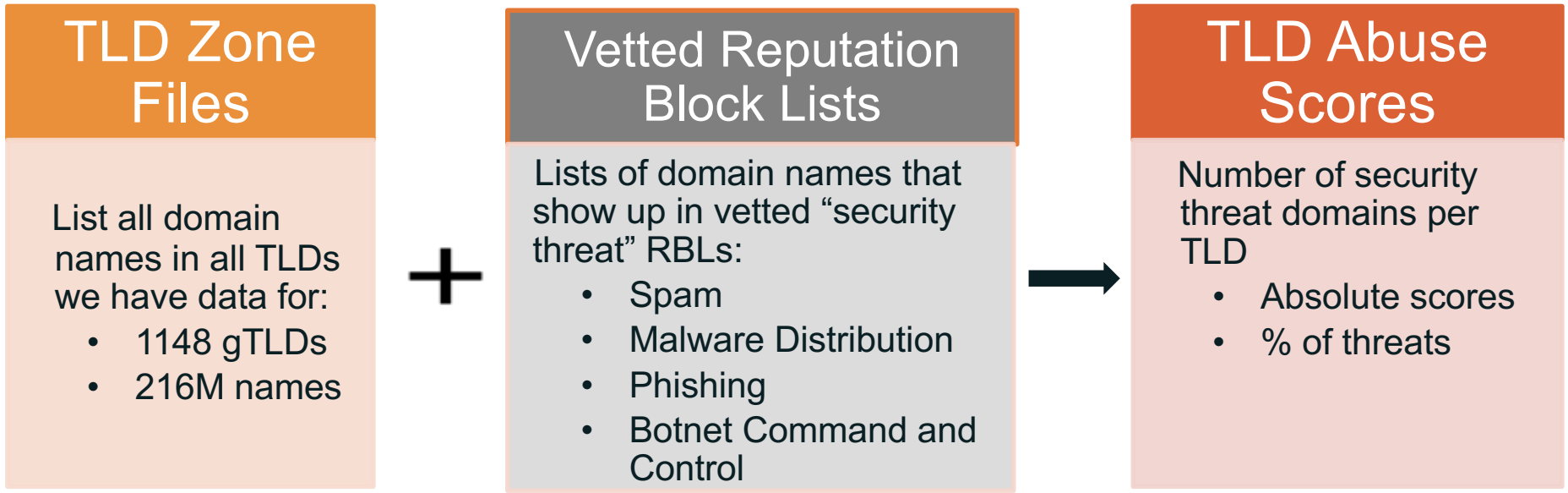
DAAR Project

- A system to study and report on security threats across top-level domains
- Be a robust, reliable, and reproducible methodology for data collection that can then be used by the ICANN community to facilitate informed policy decisions.

Full details can be found at:

https://www.icann.org/octo-ssr/daar

DAAR Methodology



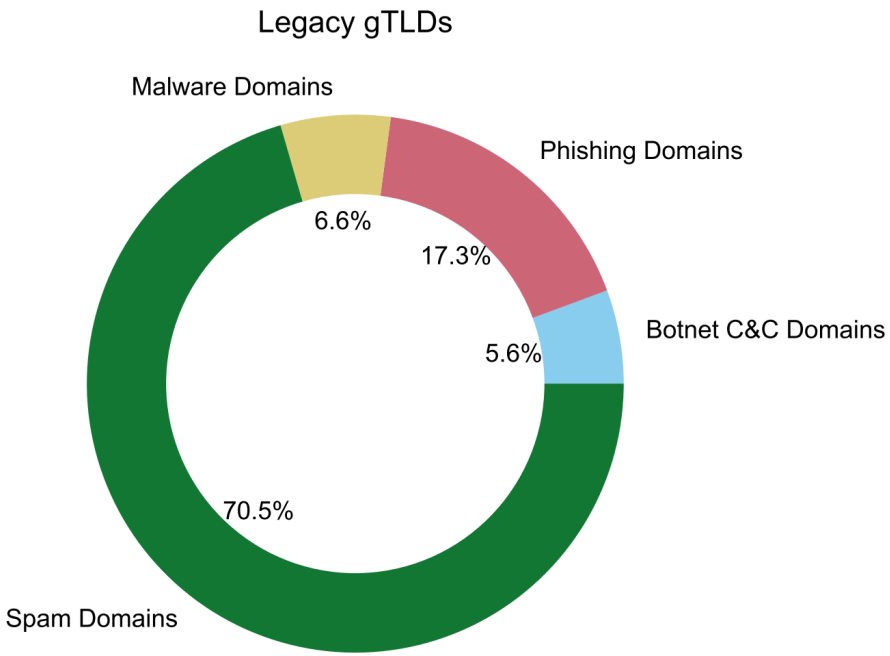
- Monthly reports (from Jan 2018) published at https://www.icann.org/octo-ssr/daar
- Daily scores made available to TLDs via the Monitoring System API (MoSAPI)
  - Allows comparison to monthly statistics

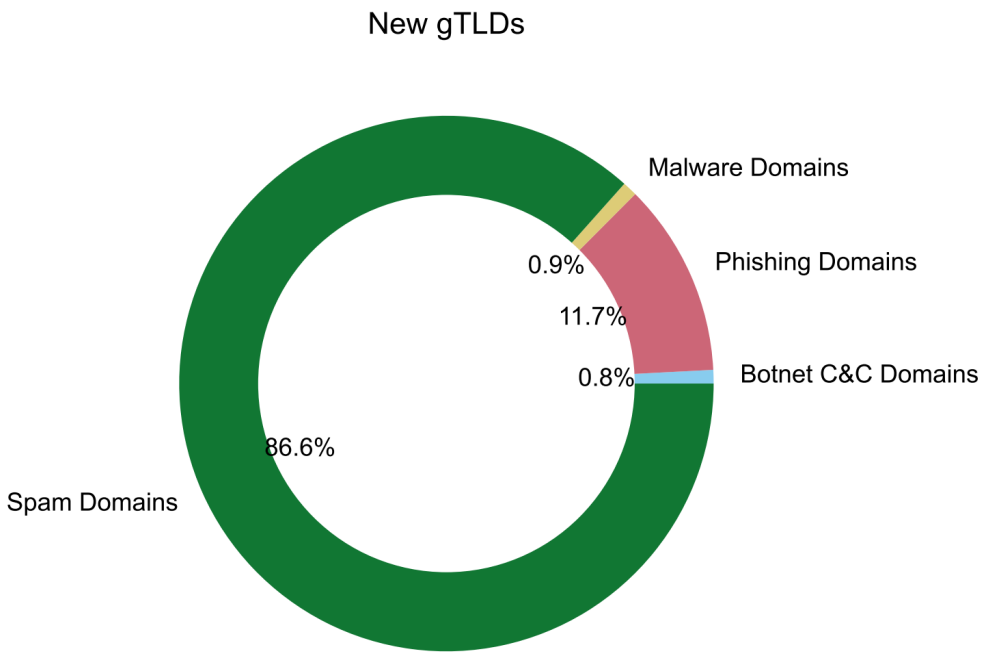
DAAR Project Uses, and Limitations

- DAAR data **CAN** be used to
  - Report on threat activity at TLD level
  - Historical analysis of security threats or domain registration activity
  - Help operators understand their reputations in the DAAR RBLs or the impact of their anti-abuse programs or terms of service
- DAAR data **CANNOT** be used to
  - Provide info about mitigation
  - Distinguish maliciously registered vs. compromised domains
  - Provide information on individual security threats within domains
  - Rank TLD providers in terms of their security concentrations

DAAR Monthly Report

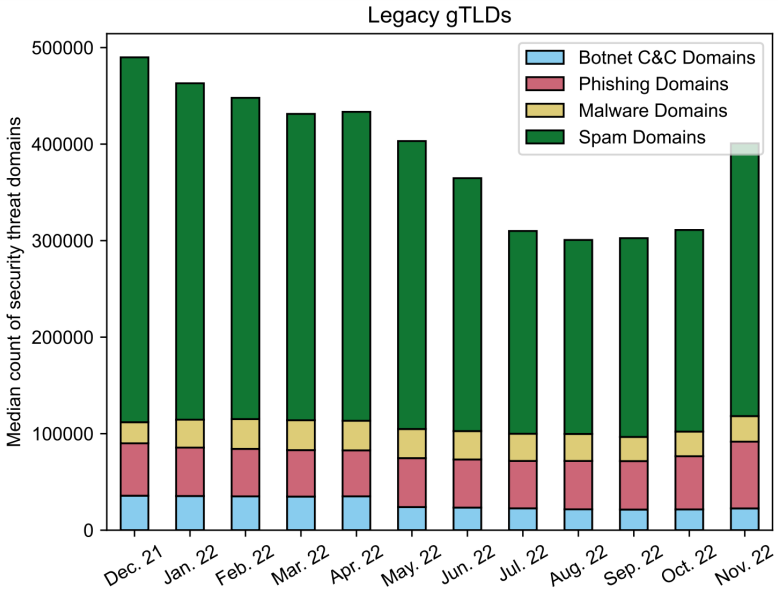
Overview

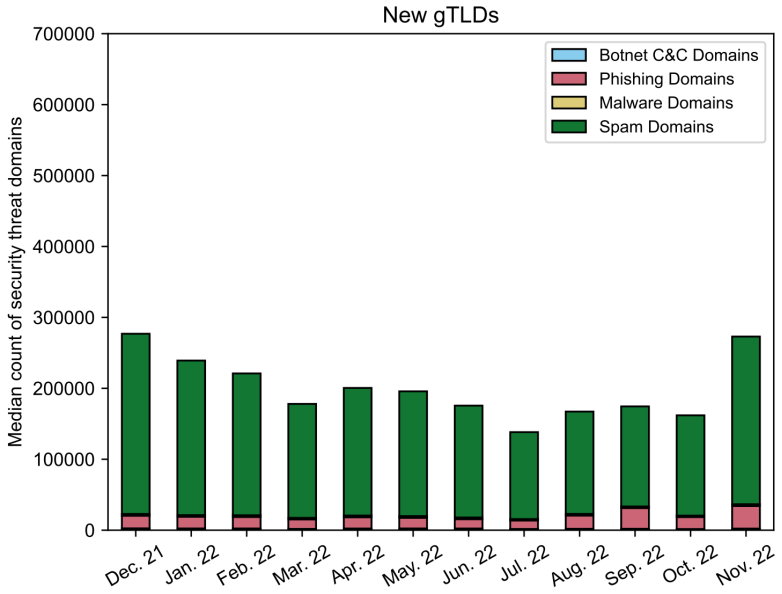


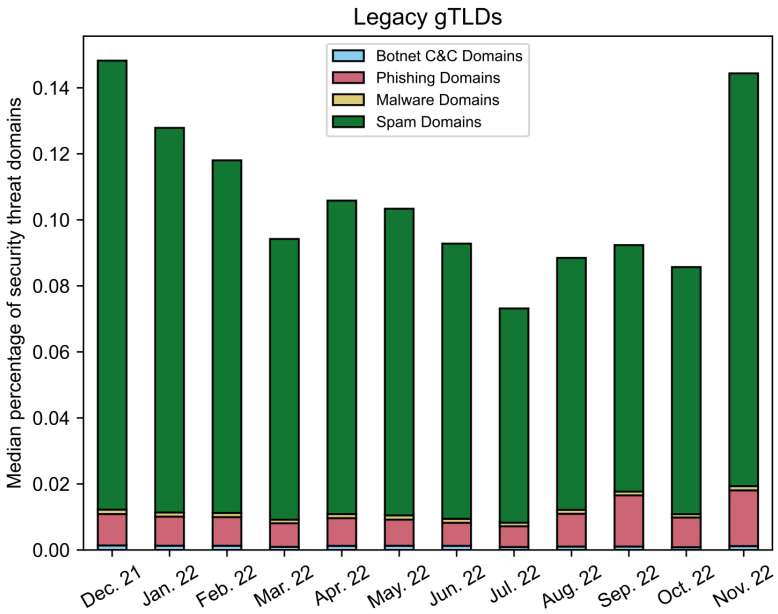


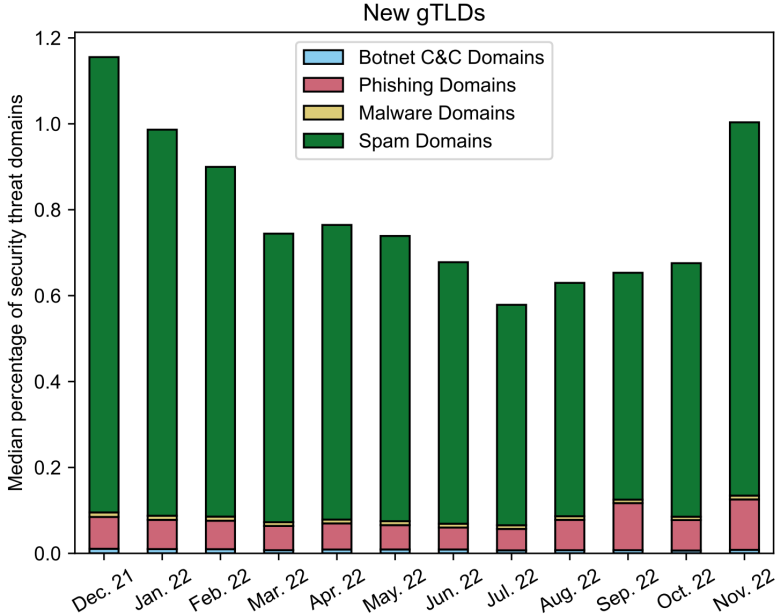
(Legacy gTLDs are those delegated pre-2010)

12-month trends

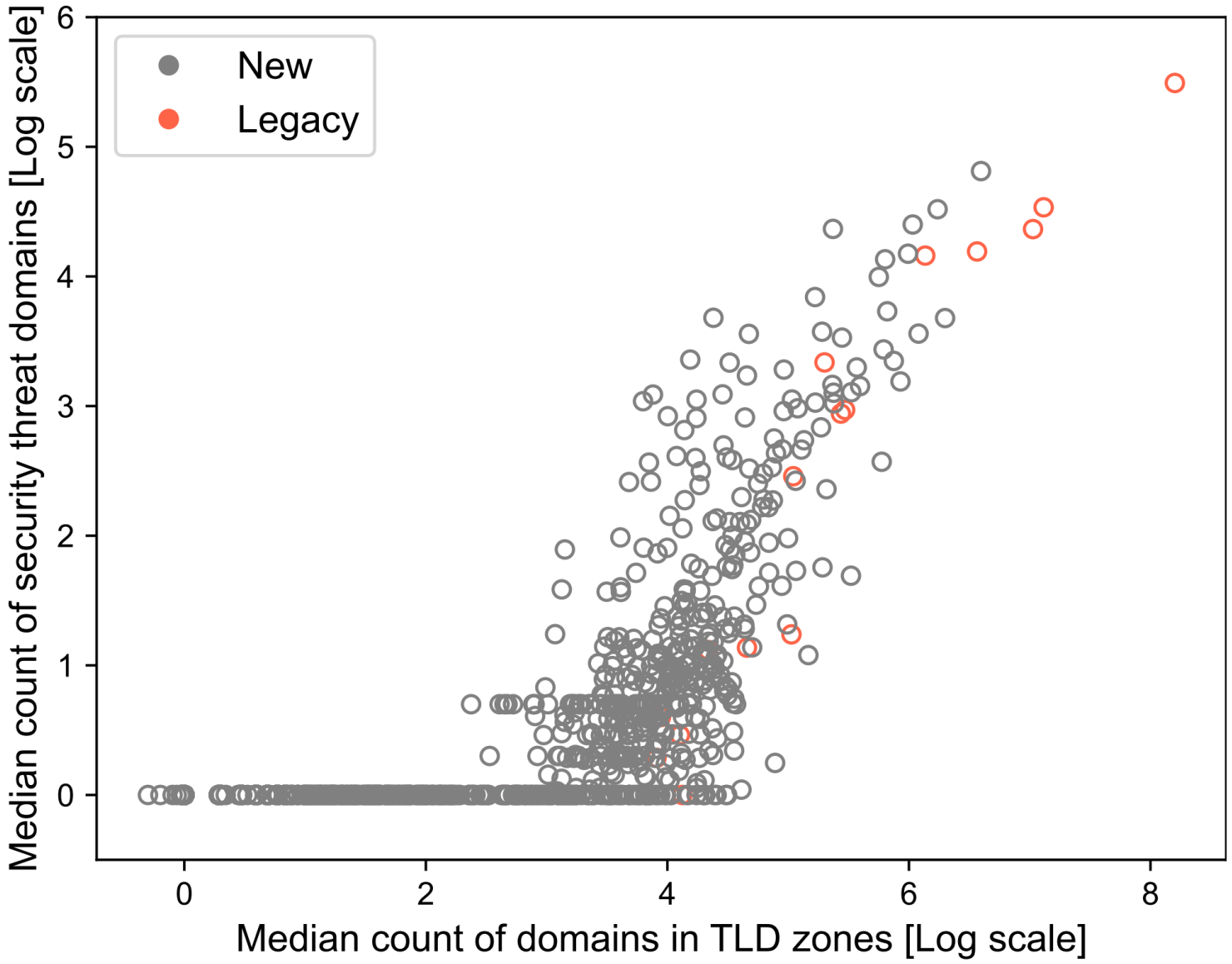






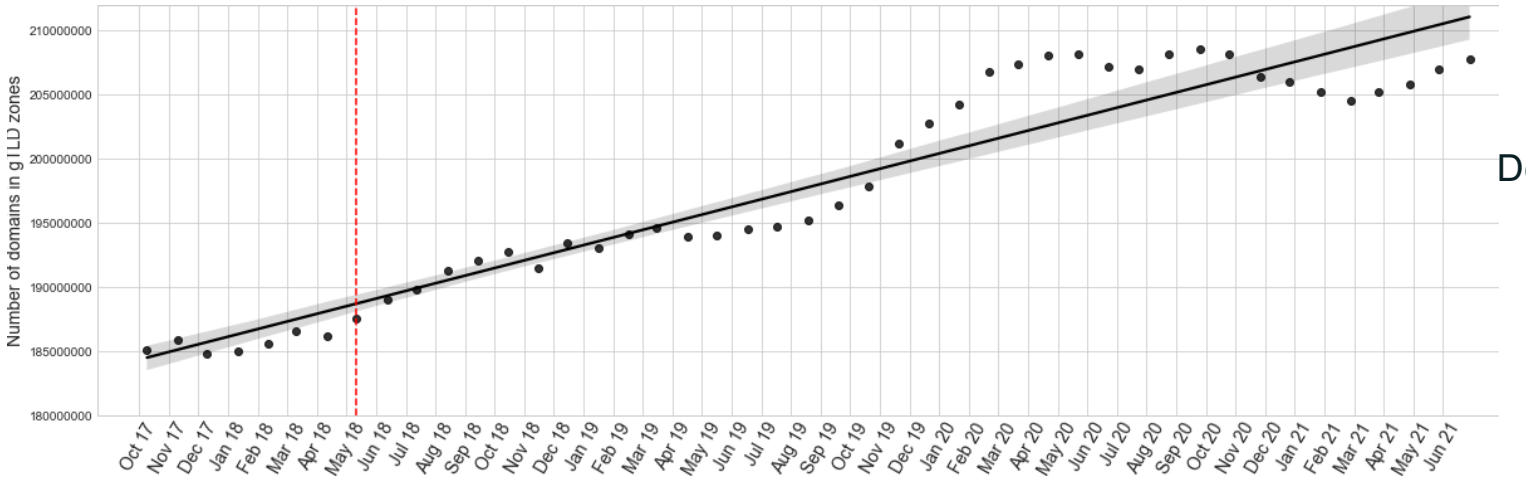


Per TLD


New
Legacy
Median count of security threat domains [Log scale]
Median count of domains in TLD zones [Log scale]
0
1
2
3
4
5
6
0
2
4
6
8

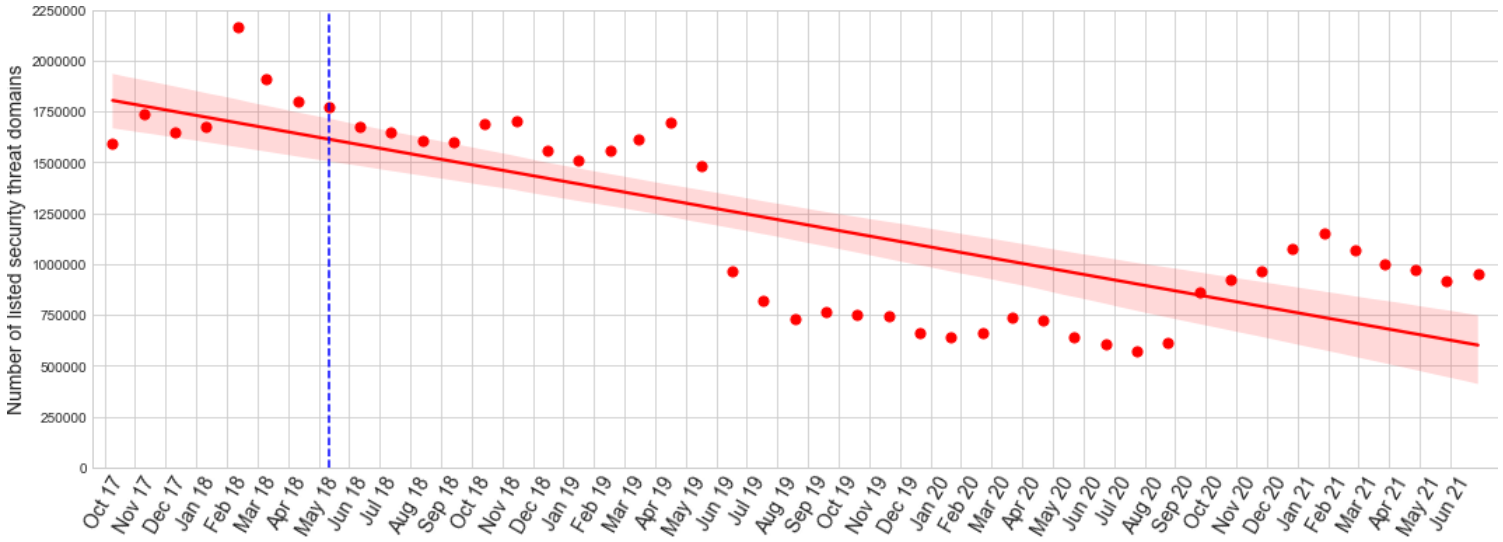
DAAR Longer term trends

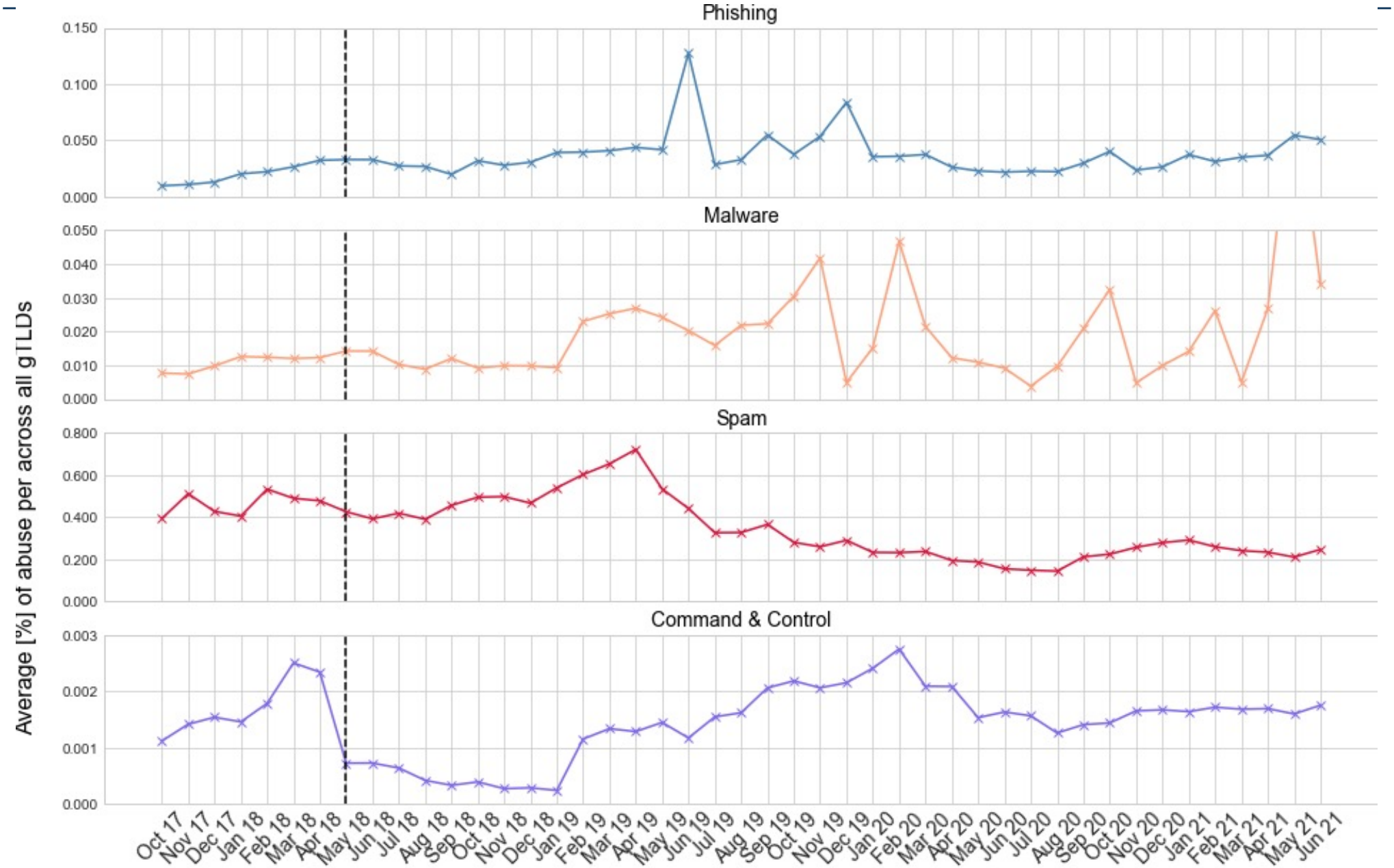
General trends in gTLDs



Domains in gTLD zones

Security threat domains in gTLDs




Phishing
Malware
Spam
Command & Control
Average [%] of abuse per across all gTLDs
0.150
0.100
0.050
0.000
0.040
0.030
0.020
0.010
0.800
0.600
0.400
0.200
0.003
0.002
0.001
Oct 17
Nov 17
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Feb 21
Mar 21
Apr 21
May 21
Jun 21

ccTLDs

ccTLDs in DAAR

21 of 316 ccTLDs are participating in DAAR:

- .au (Australia)
- .se (Sweden)
- .tw (Taiwan)
- .cl (Chile)
- .nu (Niue)
- .ee (Estonia)
- .tz (Tanzania)
- .gt (Guatemala)
- .sv (El Salvador)
- .mw (Malawi)
- .gg (Guernsey)
- .je (Jersey)
- .ch (Switzerland)
- .ke (Kenya)
- .in (India)
- .ca (Canada)
- .li (Liechtenstein)
- .co (Colombia)
- .fo (Faroe)
- .fr (France)
- .pt (Portugal)

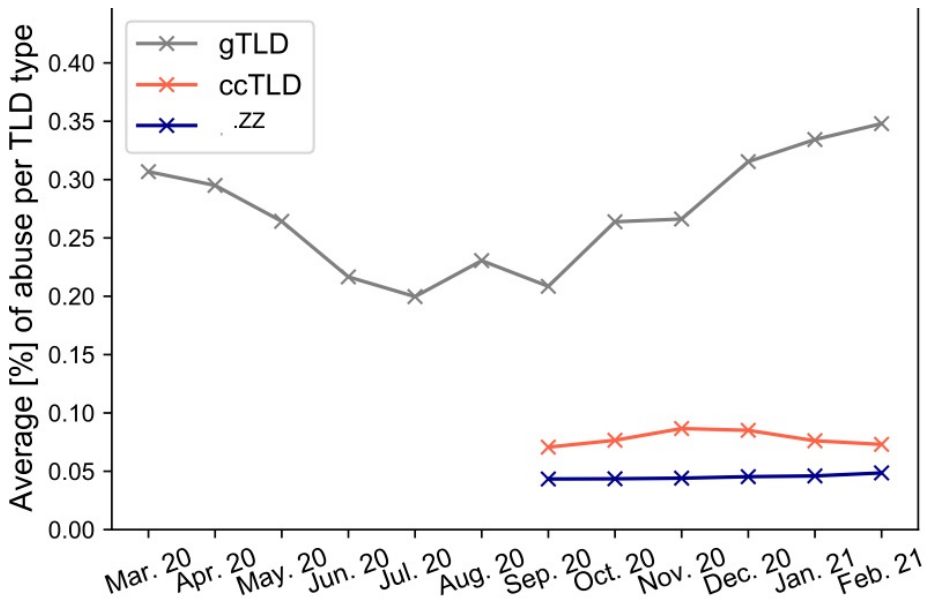
We provide:

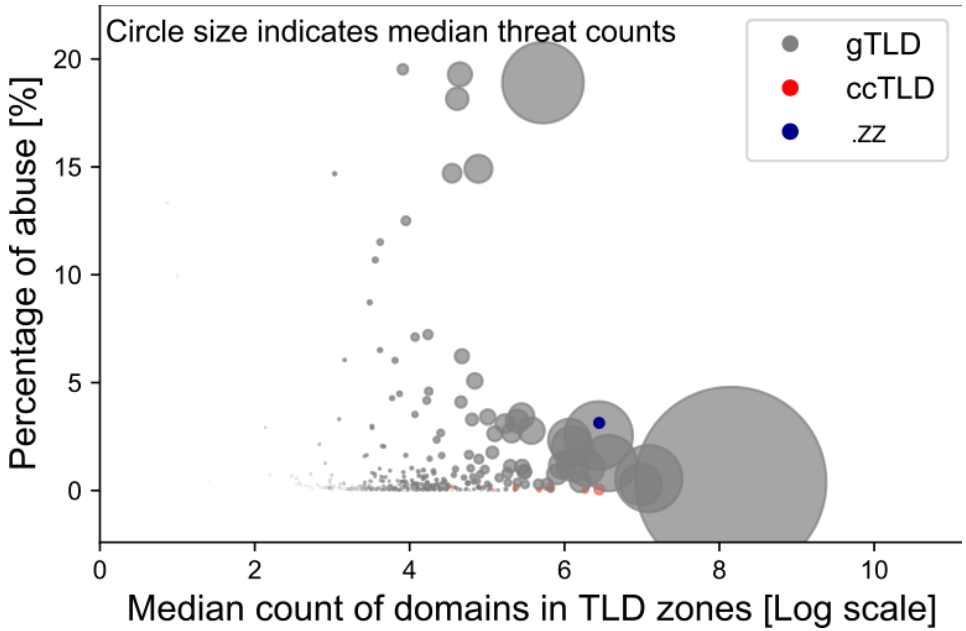
- Daily DAAR stats
- **Individualized** DAAR monthly reports

Latest blog post about DAAR and ccTLDs:

https://www.icann.org/news/blog/daar-activity-project-now-providing-personalized-monthly-reports-for-cctlds

Individualized Report Example: Aggregate Threats over All TLDs





Future Plans

- Adding more ccTLDs
- Provide individualized reports to all DAAR participants
- Publish methodology for RBL evaluations
- DAAR Evolution
  - Provide domain level sharable RBL data
  - Registrar level metrics
  - Uptime (Security Threat Persistence Metrics)
  - Malicious vs. Compromised
  - Security Threat Prediction
  - Dynamic Dashboard
  - API
  - Others …

Domain Name Security Threat Information Collection and Reporting (DNSTICR)

Identification and Reporting of pandemic-related malicious domain names

DNSTICR

(Spoiler alert!)

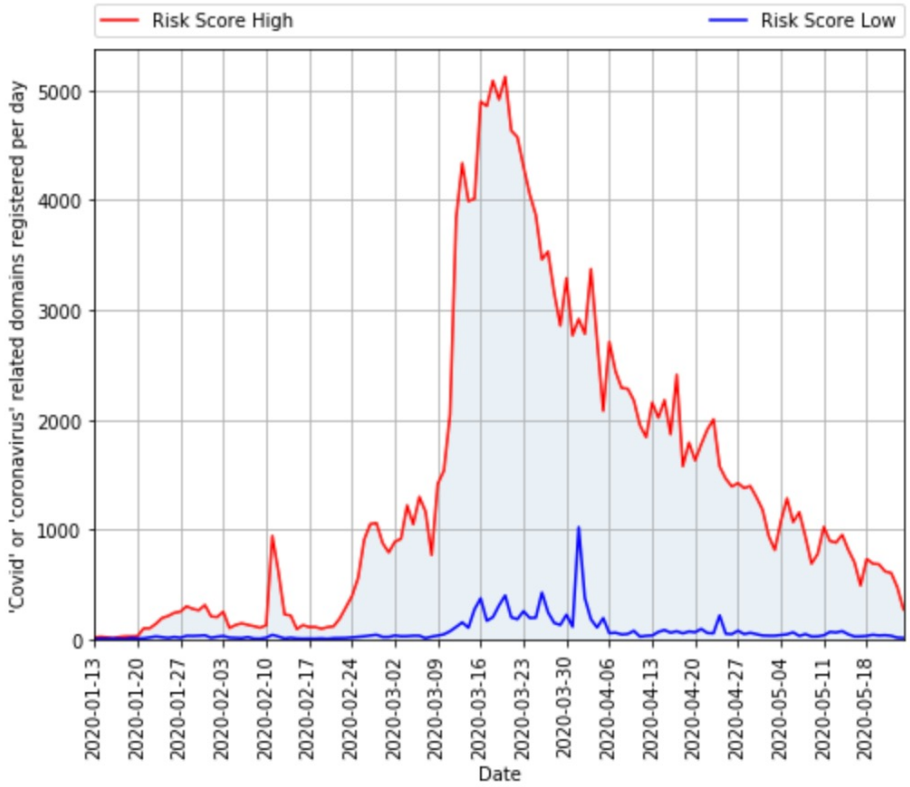
- Criminals use the internet
- Criminals use big events to “hook” victims
- Global event + Internet = Mass audience

- Big events have associated bursts of domain name registration
- COVID-19 no different
  - The extra working from home made it the perfect storm

Context

TLP: White

Domain trends update



(Source: John Conwell, DomainTools)

DNSTICR

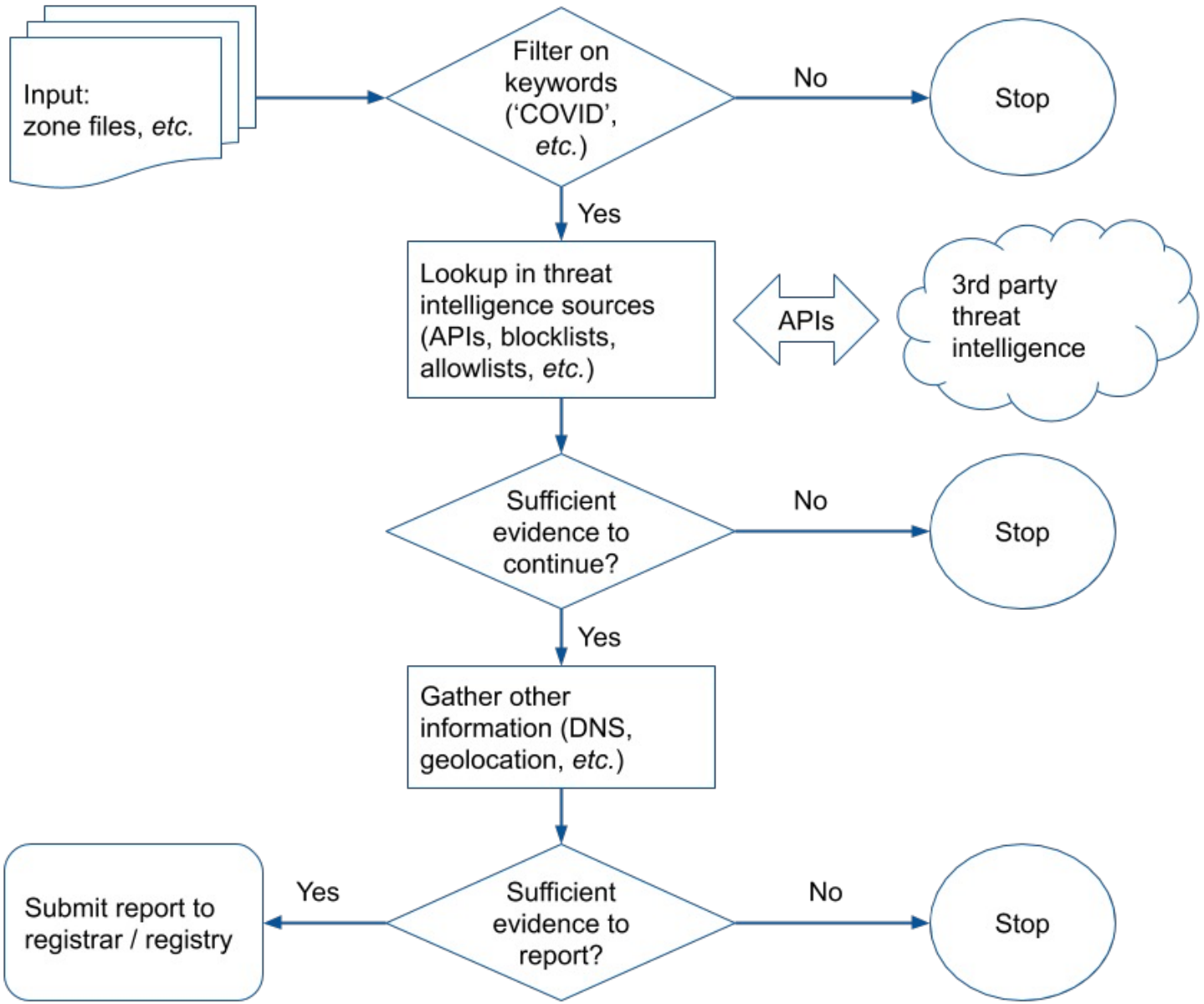
- Many articles talked about “suspicious” or “potentially malicious” registrations
- Some looked at full URLs, some at domains, some at certificates…

- Wanted a clear, published methodology
- Get good intelligence to the right people

- April 2022 – added terms related to conflict in Ukraine

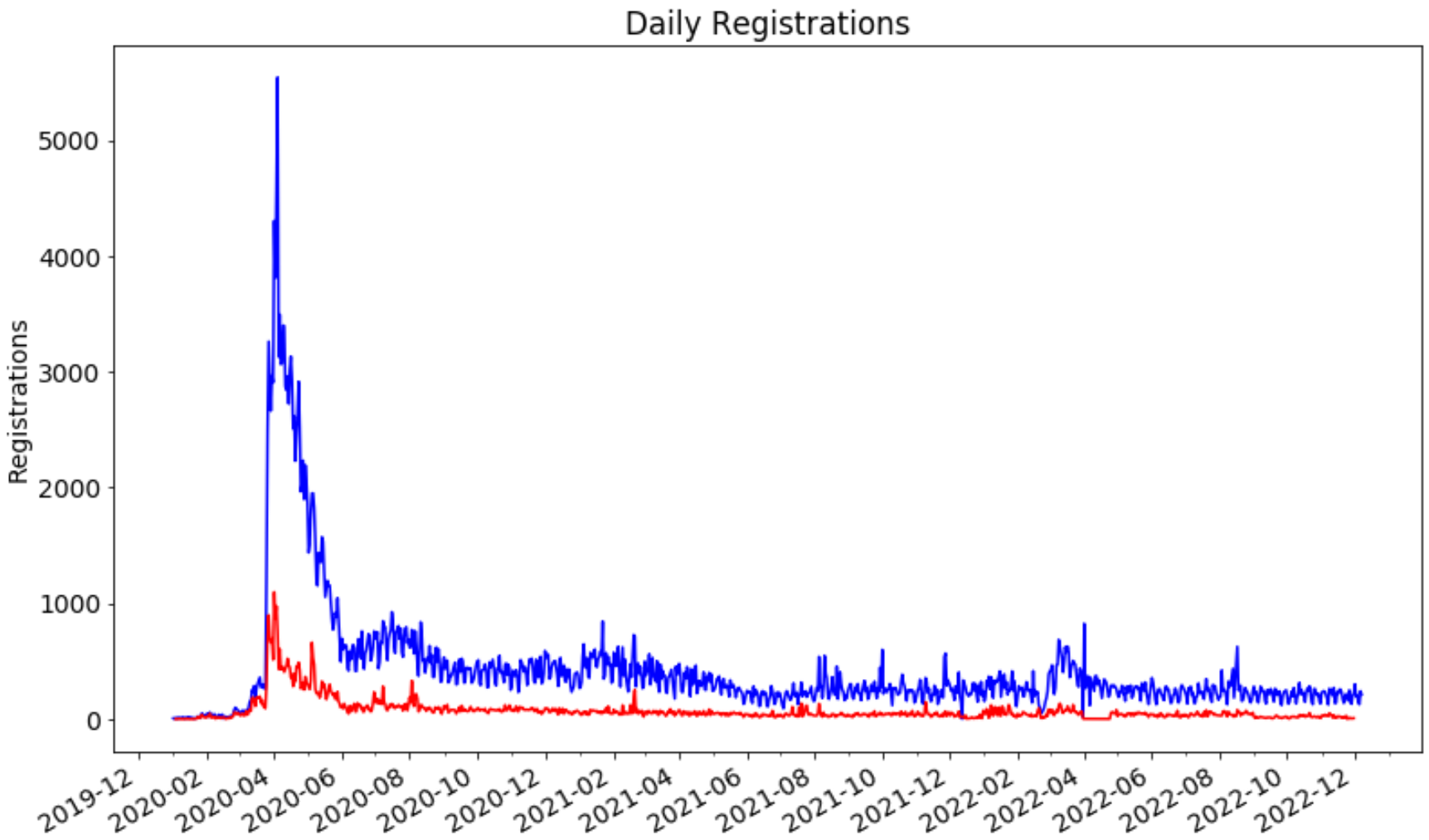
Methodology

DNSTICR - Data to Intelligence



Results

Full Picture

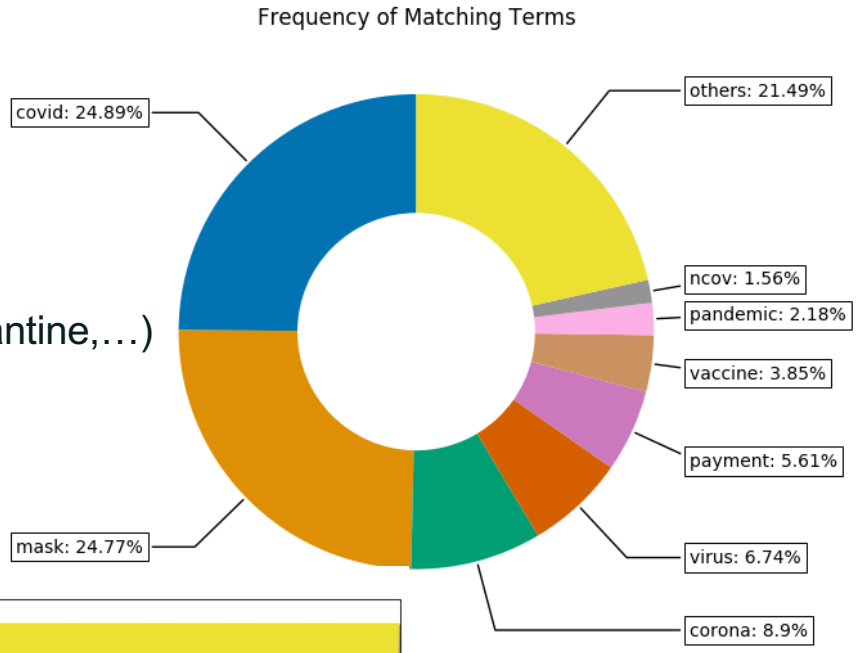


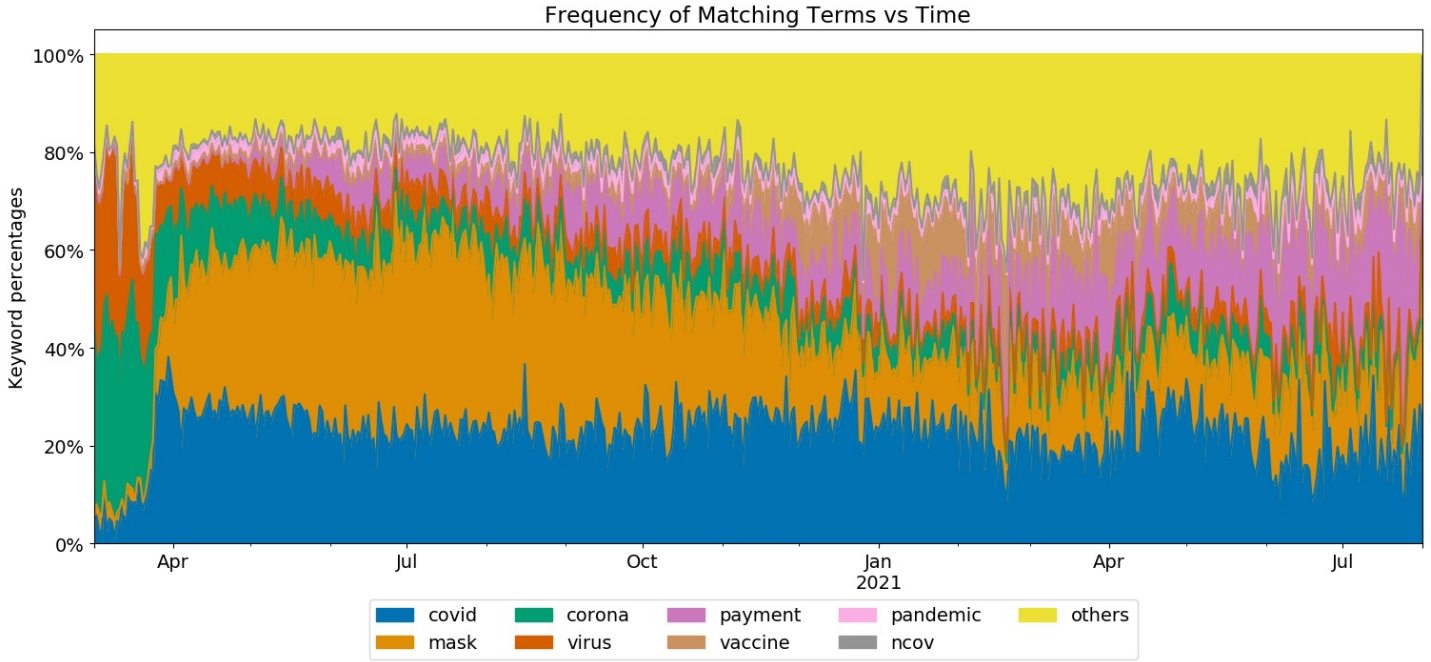
Registrations per day matching one or more of our filter terms (blue line) plus those which had one or more third-party reports (red line). Dates in DD-MM-YYYY format.

What keywords do these domains contain?

In the first 18 months:

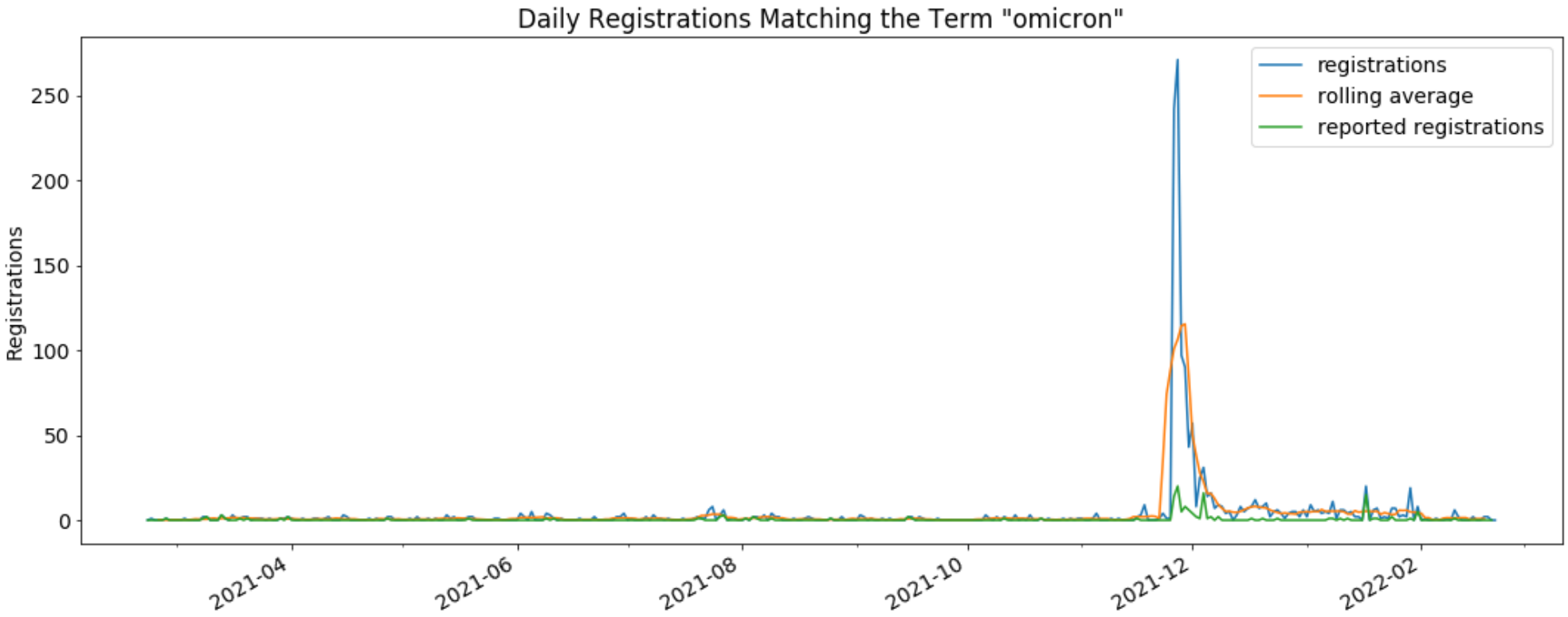
- Top four keywords account for 2/3 of the domains
- Different keywords categories:
  - Disease name (covid, ncov, sars, …)
  - Pandemic countermeasures (mask, lockdown, quarantine,…)
  - Collateral (zoom, webex, conference, …)
- Significant number of domains match non-English terms





New search terms

- New terms added, *e.g.*
  - Passport
  - Immunity
  - Omicron



Statistics

- 2020 – December 2022
  - 579 Search terms
  - 489,169 matched one or more search term
  - 28,411 (5.8%) had third-party reports
- Many matching terms but not covid related
  - “mask” matches “metamask” (crypto wallet) phishing/fraud
  - “payment” matches financial phishing/fraud
- Seeing lots of similar-looking registrations being reported but we see only parked pages

Thank You and Questions

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