

Public Health Data in Elastic

Sean Colyer. June 24, 2021.

M30714 New In Box Temperature Check Scanning Kiosks Auction Silver Springs, MD

A medical technology company is selling hundreds of new in box temperature check scanning kiosks. This sale has stand-alone, wall-mounted, and desk top units.



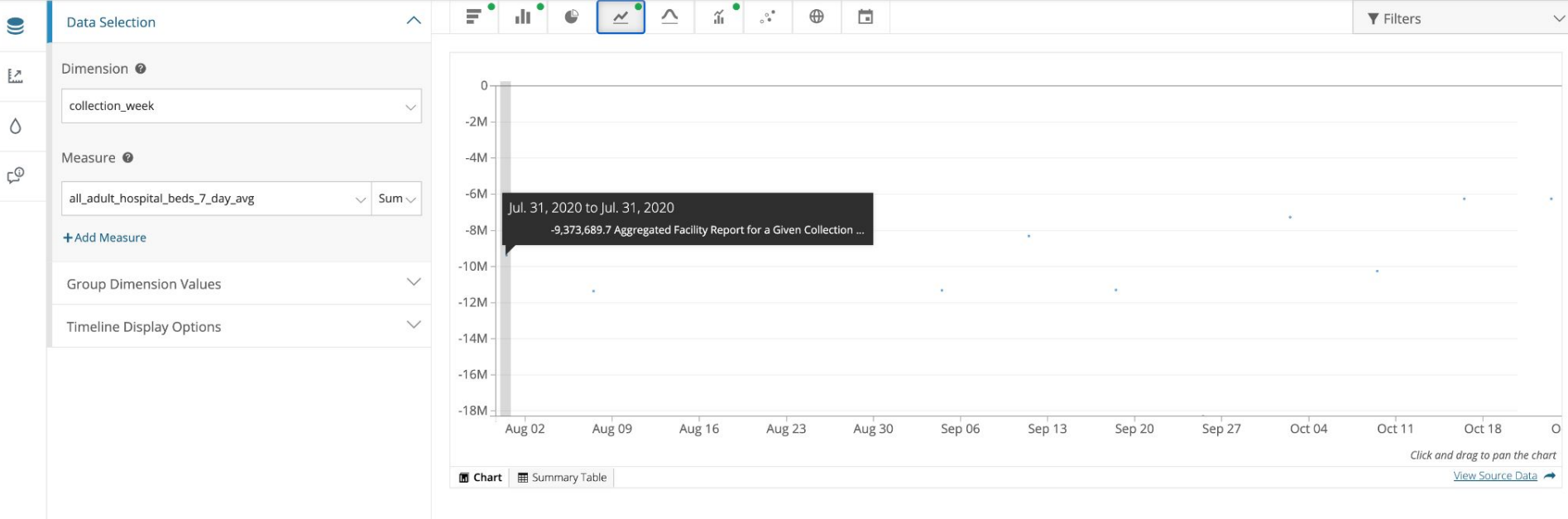
Caveats

- These are questions **I** found interesting
- That does not mean these are **THE** questions to answer
- I must assume there are many things I do not see
- Time is limited, use existing data and graphs where you can
- Hindsight is 20/20

**How many hospital beds were used
on average over time in 2020?**

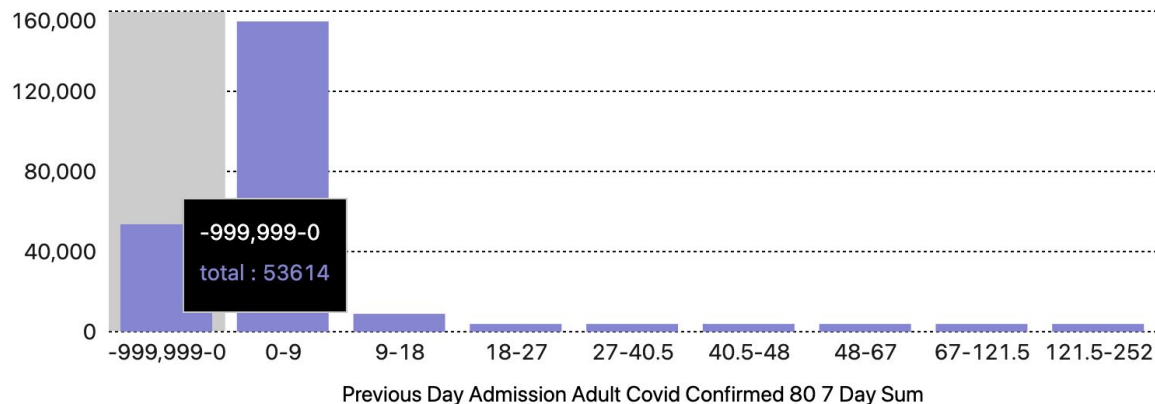
-9,373,689.7

Configure Visualization



<https://healthdata.gov/d/uqq2-txqb/visualization>

Distribution of Previous Day Admission Adult Covid Confirmed 80 7 Day Sum

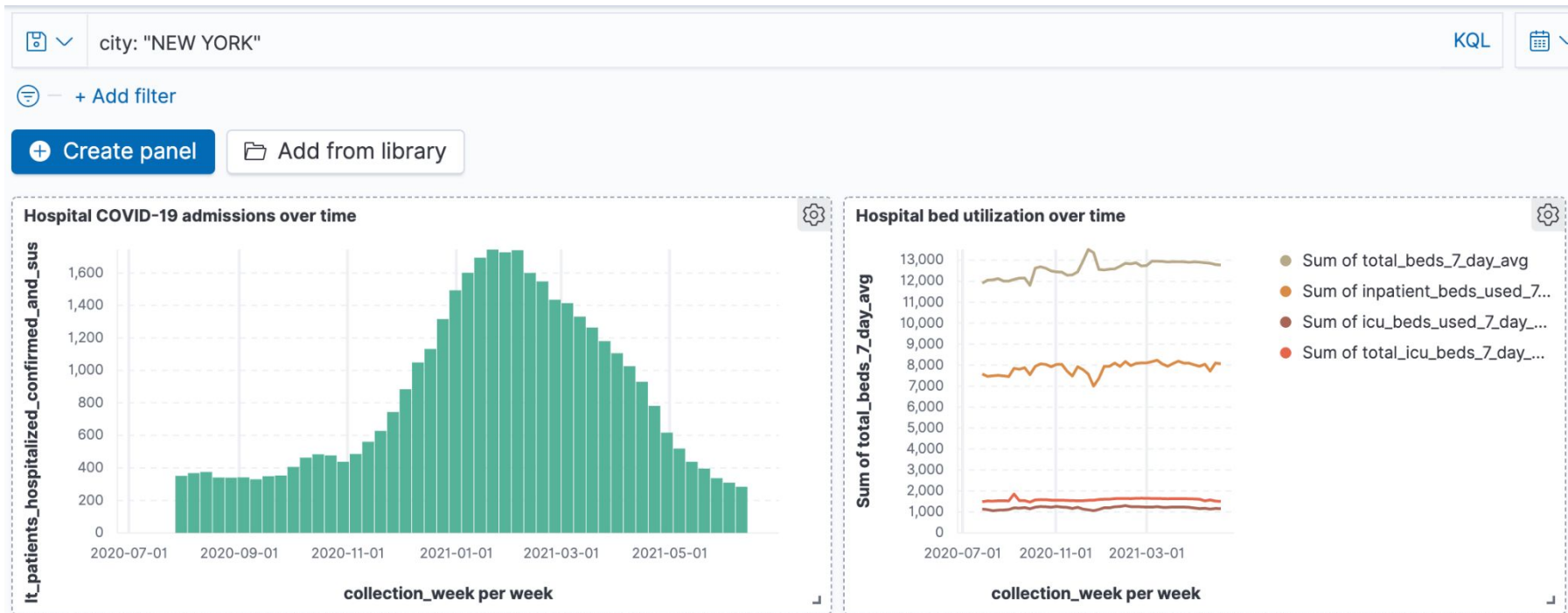


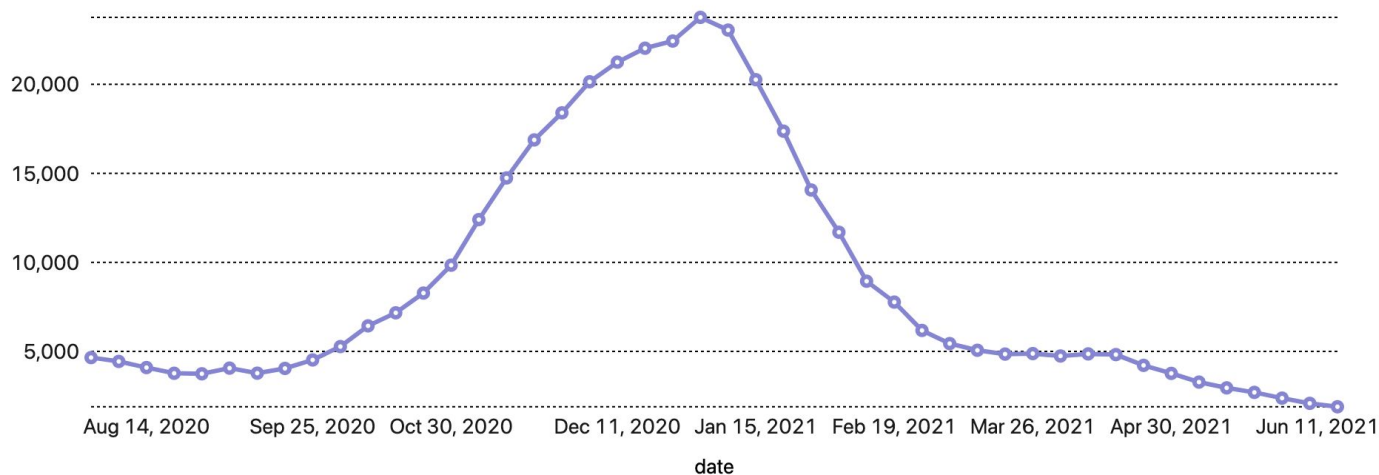
N Of the **229,514** records analyzed, the Previous Day Admission Adult Covid Confirmed 80 7 Day Sum has a range between **-999,999** and **252** with an average value of **-233,570.24**.

The Previous Day Admission Adult Covid Confirmed 80 7 Day Sum typically falls between **-846,206.32** and **252**.

67.49% of the records have Previous Day Admission Adult Covid Confirmed 80 7 Day Sum values that fall within the range of **0** and **9**.

Flattening the curve





Significant Changes

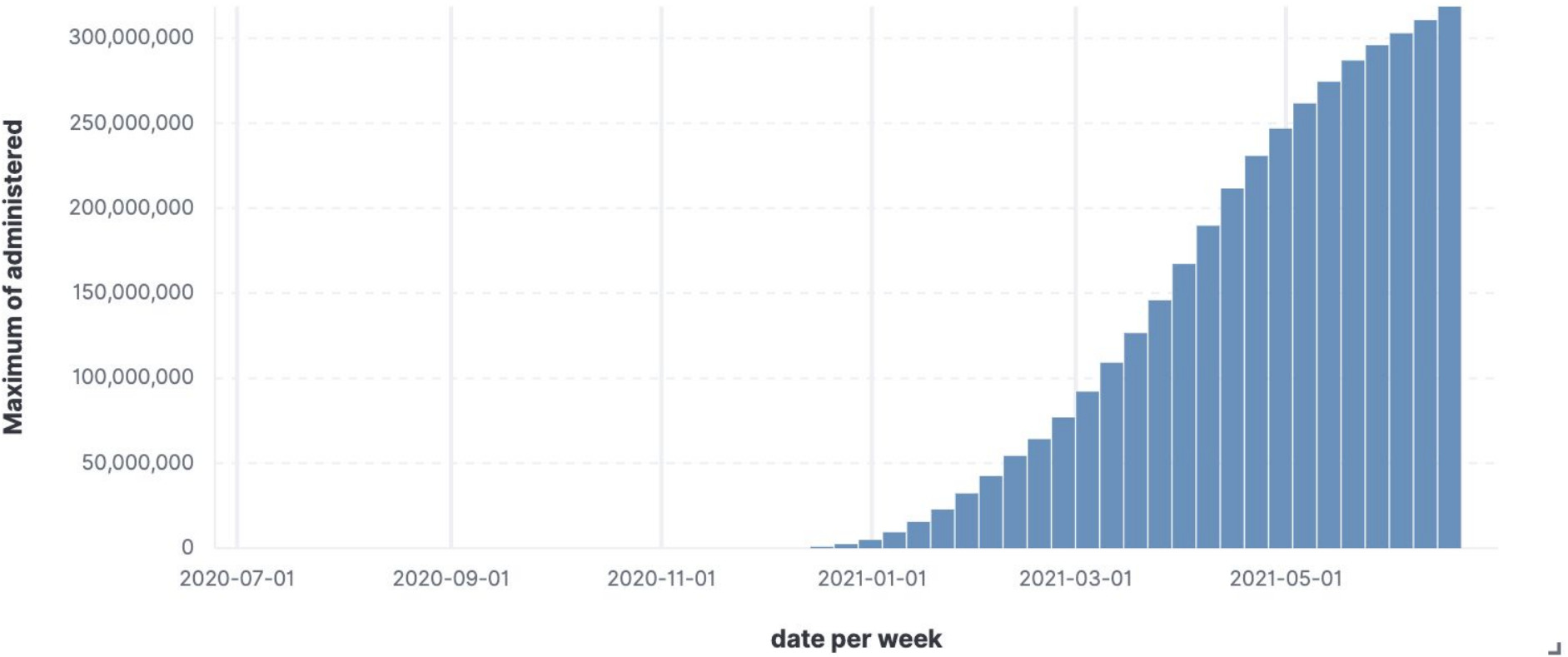
Significant Increases

- On **Nov 06, 2020**, the sum total of **Previous Day Admission Adult Covid Confirmed 80 7 Day Sum** was **26% higher (12,401)** than the previous time period (**9,842**).
- On **Oct 09, 2020**, the sum total of **Previous Day Admission Adult Covid Confirmed 80 7 Day Sum** was **22.08% higher (6,435)** than the previous time period (**5,271**).
- On **Oct 30, 2020**, the sum total of **Previous Day Admission Adult Covid Confirmed 80 7 Day Sum** was **18.91% higher (9,842)** than the previous time period (**8,277**).
- On **Nov 13, 2020**, the sum total of **Previous Day Admission Adult Covid Confirmed 80 7 Day Sum** was **18.86% higher (14,740)** than the previous time period (**12,401**).

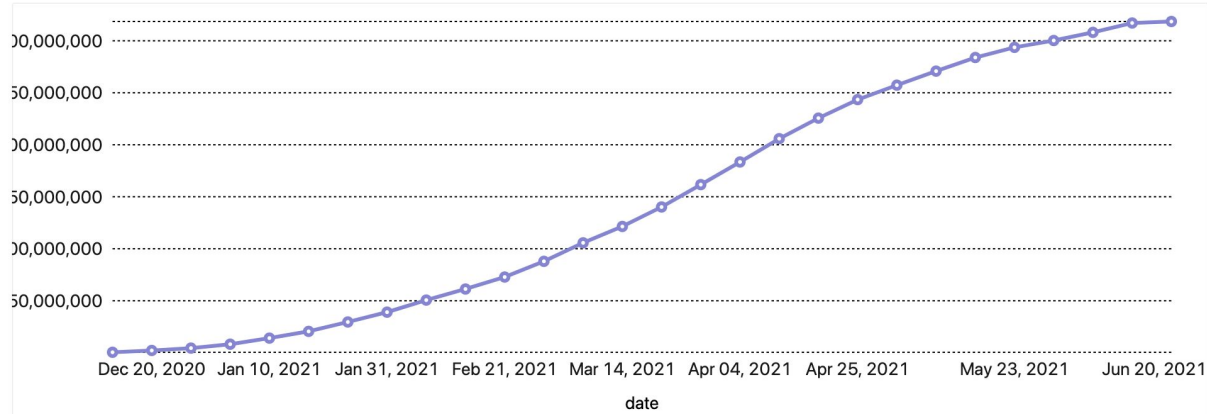
What should
we do RIGHT
NOW?

Vaccinations

Total administered vaccines over time



Maximum of Administered Over Time



Significant Changes

Significant Increases

- On Dec 20, 2020, the maximum of **Administered** was **395.96% higher (2,190,414)** than the previous time period (**441,650**).

Virginia Small Business

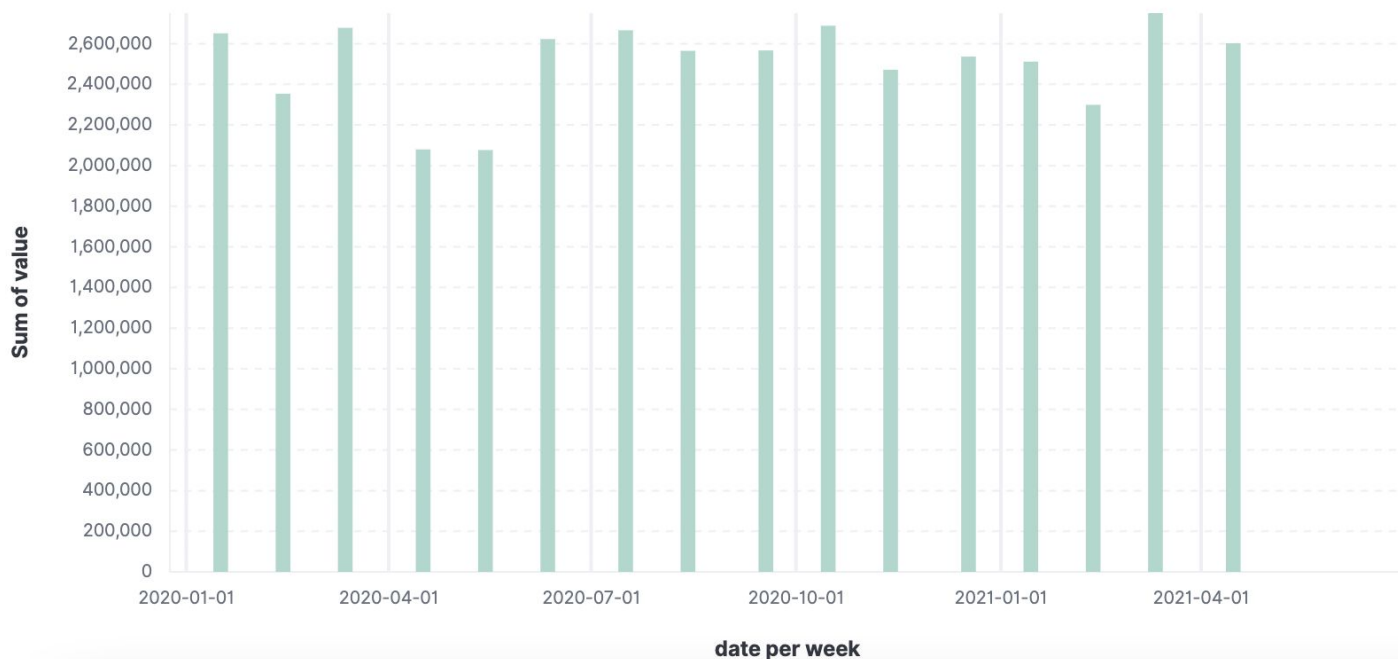
Small Businesses Open and Revenue



Agriculture

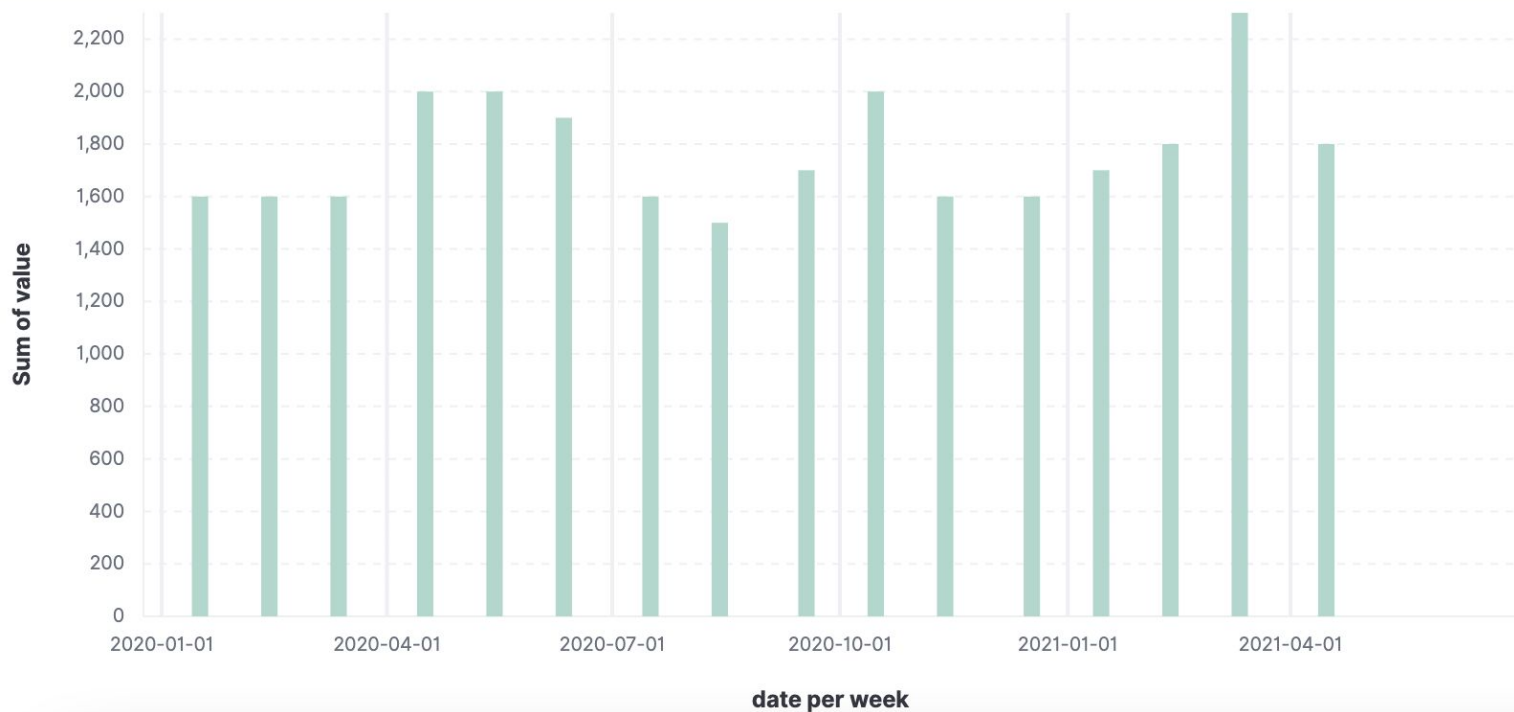
National Cattle Processing

Sum of Cattle Processing

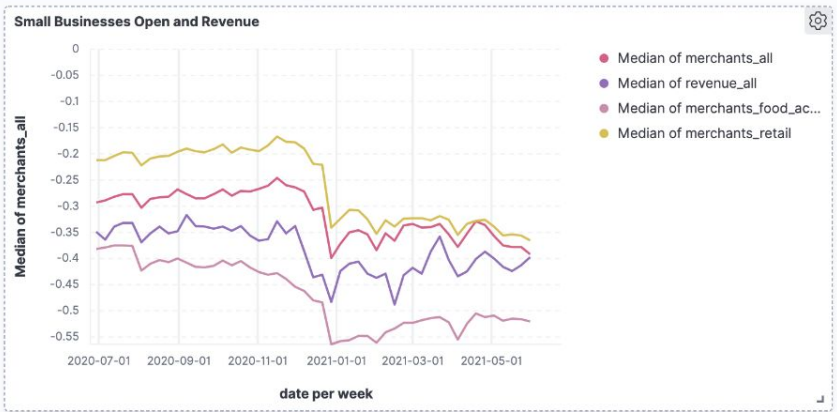
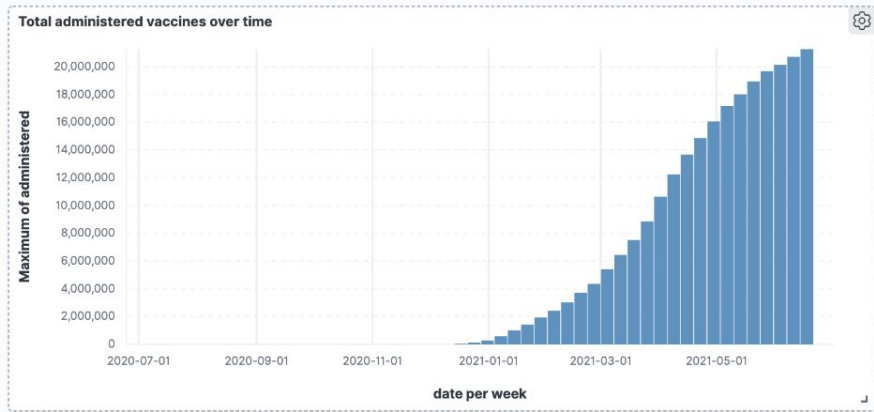
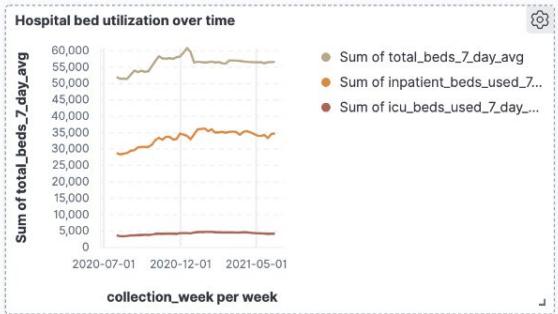
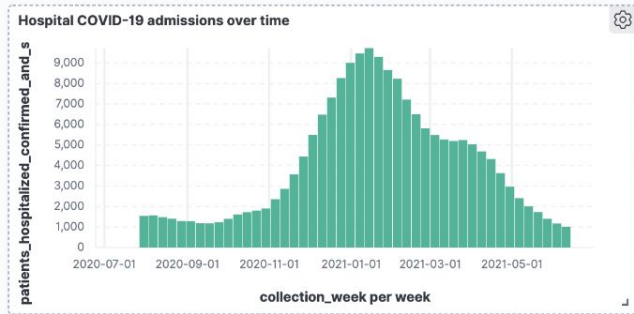


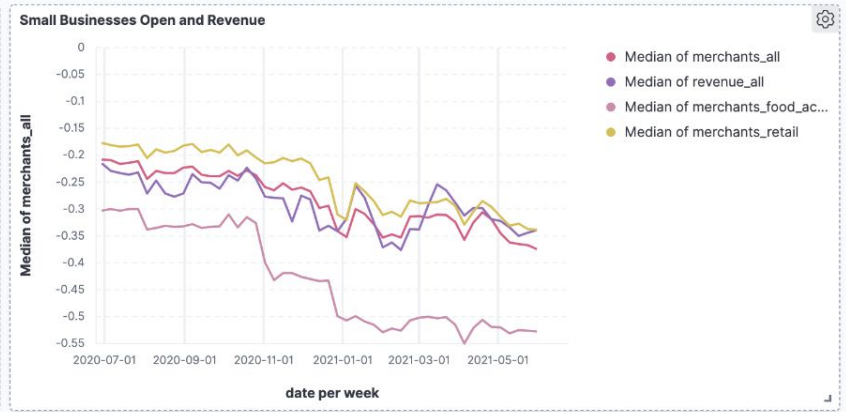
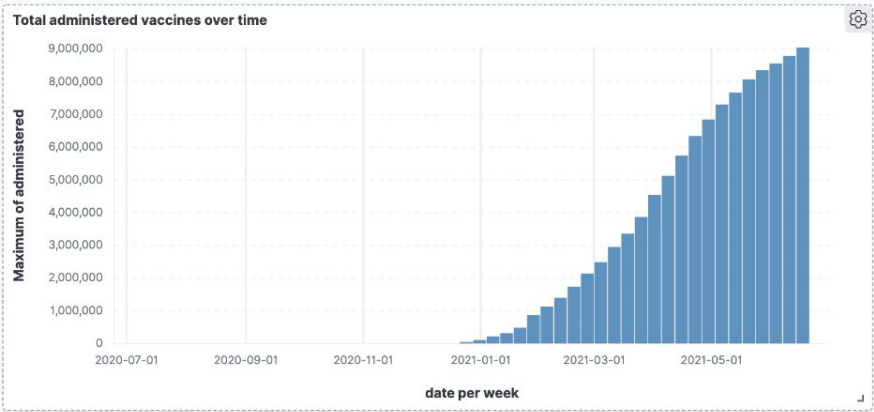
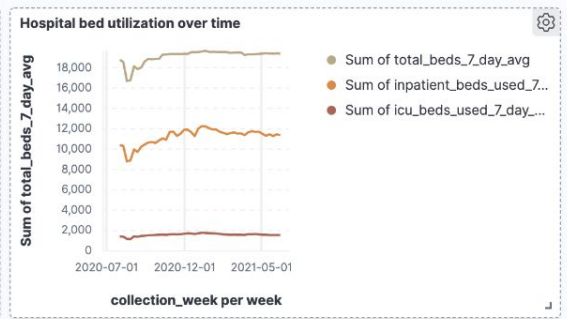
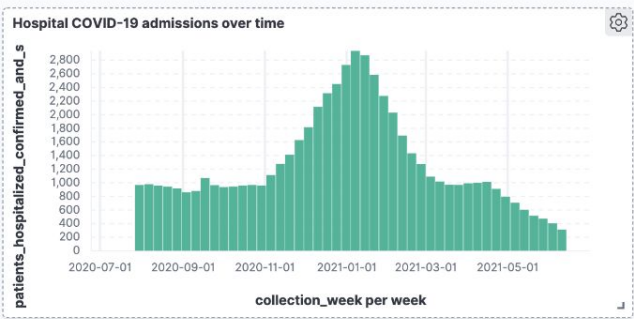
Virginia Cattle Processing

Sum of Cattle Processing



All Together





Data Engineering

```
~/Documents/Data Samples/Covid - Elastic Talk
```

```
> head /Users/seancoyer/Documents/Data\ Samples/Covid\ -\ Elastic\ Talk/EconomicTracker-main/data/Womply\ -\ State\ -\ Daily.csv
```

```
year,month,day,statefips,revenue_all,revenue_inchigh,revenue_inclow,revenue_incmiddle,revenue_ss40,revenue_ss60,revenue_ss65,revenue_ss70,revenue_food_accommodation,revenue_retail,merchants_all,merchants_inchigh,merchants_inclow,merchants_incmiddle,merchants_ss40,merchants_ss60,merchants_ss65,merchants_ss70,merchants_food_accommodation,merchants_retail
```

```
2020,1,10,1,-.0102,.0193,-.0182,-.00962,-.0112,.0172,-.0147,.0109,.0233,-.000554,.00258,.00879,.00585,-.00266,.00755,.0182,-.0135,.00308,.00672,.00516
```

```
2020,1,10,2,.017,-.00186,-.0735,.0394,.0368,-.0213,-.121,.0207,.0123,.0321,.00594,-.00101,.102,.00582,.0369,-.0471,-.041,.0109,.00395,.0142
```

```
2020,1,10,4,-.0269,-.00474,-.0418,-.0268,-.02,-.0142,-.0191,.000326,-.000834,-.0219,.001,.012,-.00223,-.000746,.0151,-.00742,.00366,.000717,.000681,.00871
```

```
2020,1,10,5,-.0324,-.0985,-.0569,.0163,-.0141,-.0519,-.0336,-.0484,-.0534,-.0235,-.00255,-.00711,-.00501,.00222,.00136,-.00908,.0205,-.0198,-.02,.00204
```

```
2020,1,10,6,-.0211,-.0223,-.0474,-.0125,-.0181,-.024,-.0391,-.0147,-.00552,-.0109,-.0132,-.011,-.029,-.0104,-.00682,-.0201,-.0372,-.00421,-.00328,-.00525
```

```
2020,1,10,8,-.0249,-.0278,.0053,-.0319,-.0385,.0508,-.0145,-.0374,-.0211,-.0325,-.00849,-.0082,-.0108,-.00752,-.00544,-.0182,.00376,-.00786,-.00499,-.00245
```

```
2020,1,10,9,-.00393,-.00368,.0576,-.0258,.0142,.0457,-.00846,-.0285,-.0275,.0431,-.00206,-.00186,-.0023,-.00146,-.000978,.0394,-.00841,-.00319,-.00397,.00197
```

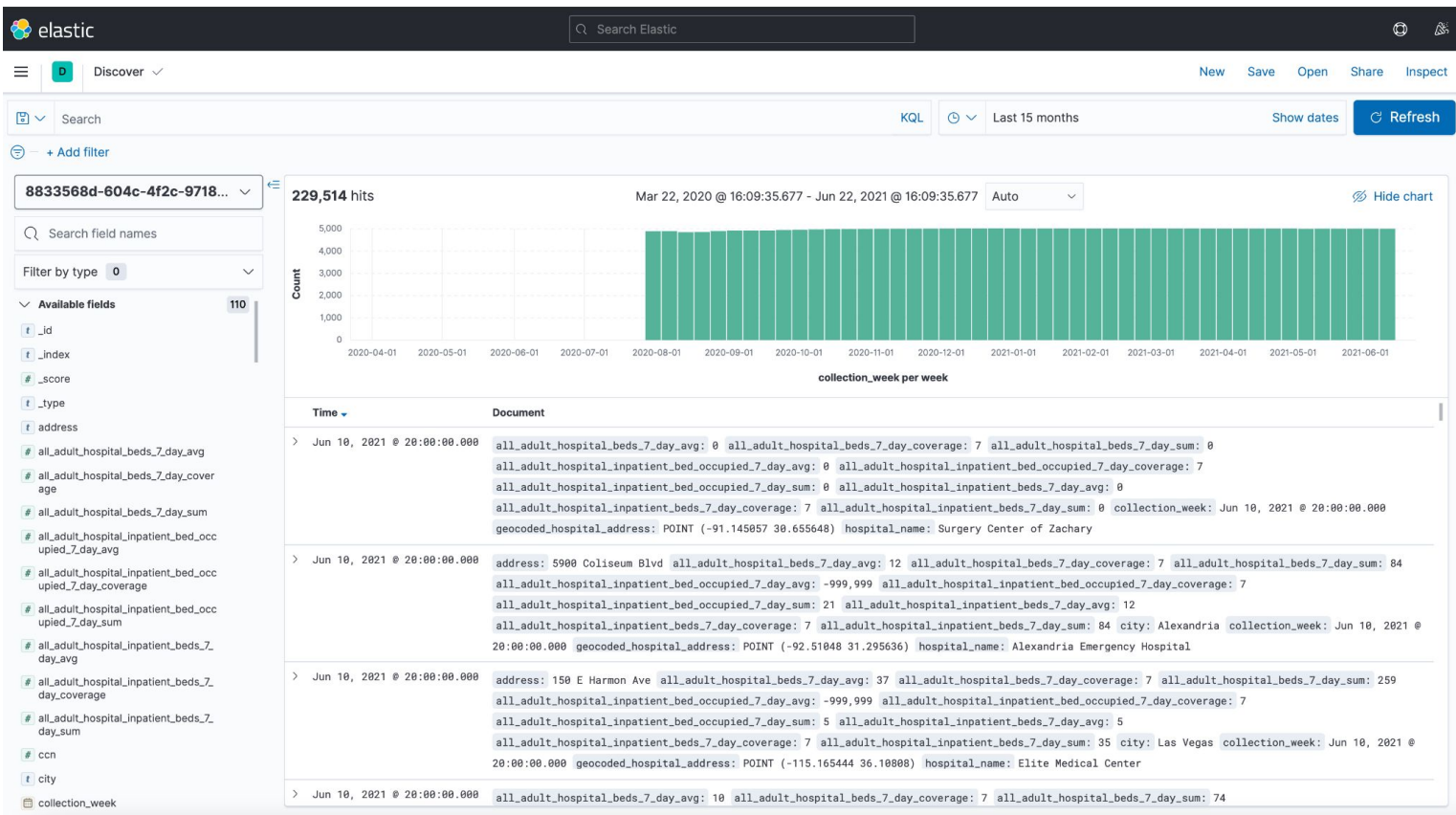
```
2020,1,10,10,-.0667,-.0156,.225,-.102,-.0576,-.286,.0281,-.0296,-.0496,-.0352,-.005,-.0133,.0667,-.0101,-.00358,-.0436,-.0101,.00978,.00525,-.000572
```

```
2020,1,10,11,-.0382,-.0481,.0706,.00744,-.101,.0984,-.0456,-.0986,-.0978,-.0795,-.0339,-.0296,.0395,-.075,-.0114,-.127,-.0424,-.0524,-.0525,-.0165
```

```
~/Documents/Data Samples/Covid - Elastic Talk
```

```
> sed 's/-999999/2/g' COVID-19_Reported_Patient_Impact_and_Hospital_Capacity_by_Facility.csv > COVID-19_Reported_Patient_Impact_and_Hospital_Capacity_by_Facility_hydrated.csv
```

Number of Data points



Process

1. Find dataset
2. Check dataset (stated end dates, missing data, weekly values)
3. Ingest into Elasticsearch via [ClearQuery](#)
4. Dashboard and deep dive in Kibana

Exploration Ideas

- What has happened with hand sanitizer?
- How did our predictions around ventilators play out?
- Was contact tracing effective?
- What have we collectively done in our time? Netflix time?
- What are the impacts of lingering health issues?
- How do variants impact the very recent situation?
- What's happening with unemployment?
- When are lockdowns effective?

Takeaways

- Small businesses are hurting
- COVID-19 is a big deal
- Good data is hard to find, be grateful for what you have
 - Frequently you'll find things that ALMOST work

Value of this type of assessment

- Data can drive our understanding of the world
- Focus; answer questions about what can I as an individual do?
- Cathartic
- Data exploration can itself be a narrative
- Don't extrapolate or narrate - try digging deeper

Questions?

- sean@clearquery.io
- [Github](#) for this work

References

- <https://covidtracking.com/data>
- <https://beta.healthdata.gov/Hospital/COVID-19-Reported-Patient-Impact-and-Hospital-Capa/anag-cw7u>
- <https://tracktherecovery.org/>
- <https://data.cdc.gov/Vaccinations/COVID-19-Vaccinations-in-the-United-States-Jurisdi/unsk-b7fc>
- <https://quickstats.nass.usda.gov/results/5E49A60D-1985-3FC7-9592-FC47002AD362> (CATTLE, GE 500 LBS, SLAUGHTER, COMMERCIAL - SLAUGHTERED, MEASURED IN HEAD)

Footnotes

1. Average of all staffed inpatient and outpatient adult beds in the hospital, including all overflow and active surge/expansion beds for inpatients and for outpatients (including all ICU, ED, and observation) reported during the 7-day period.
2. Small business is based on SBA size (ranging from 100-1500 employees depending on industry)