

# Analysis of wage and hour case data from US state labor agencies

NOTE: notes in red were added on January 11, 2023 and document how we're handling new information from the Texas Workforce Commission. See notebooks/texas/texas.ipynb for more details.

## Data import and preparation

(650225, 18)

### Data completeness

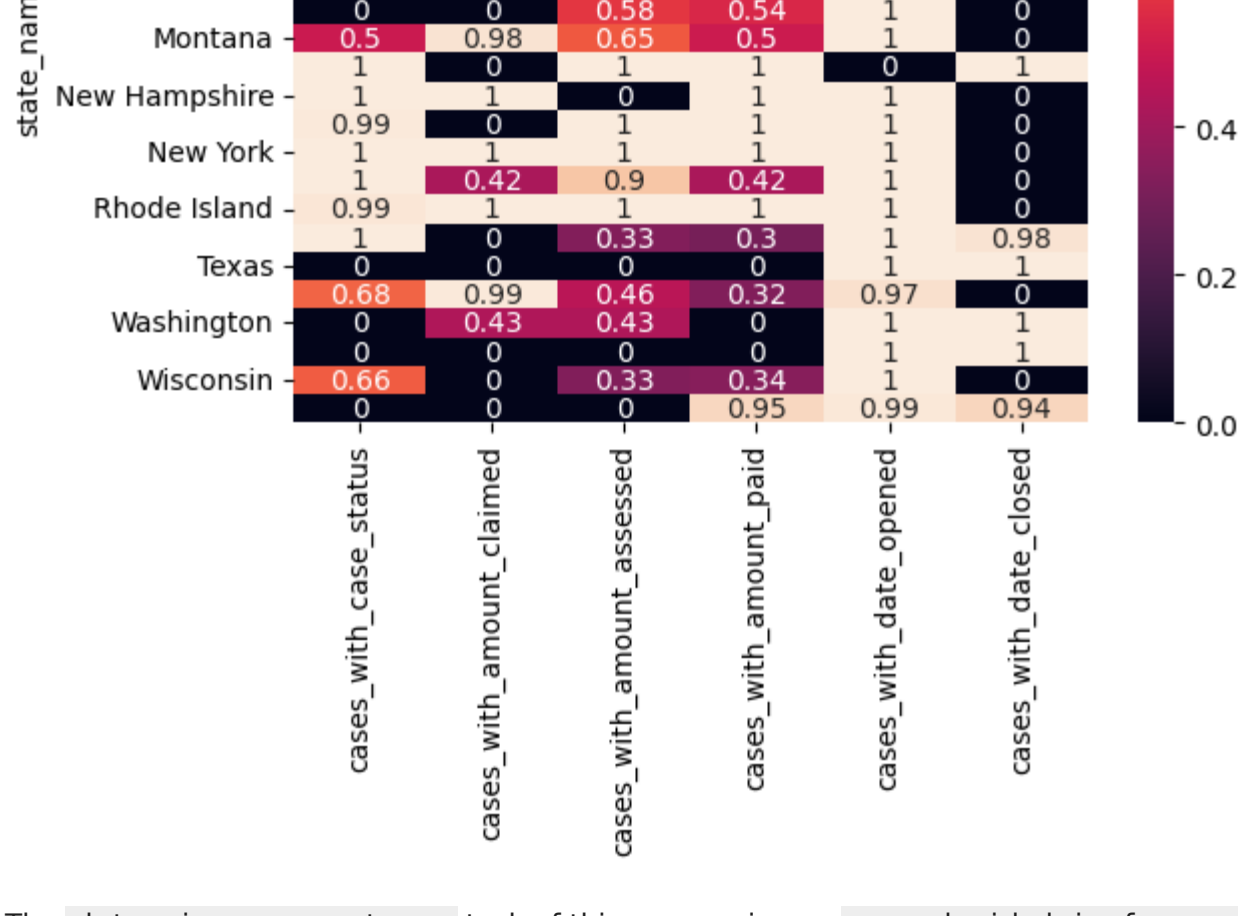
The data states provided in response to my public records requests was wildly inconsistent. I requested a long list of fields -- case statuses, start, end and paid dates, amounts claimed, assessed by the agency and paid -- but not all states possessed that data. Many states exported data directly from their case management systems, so lots of those fields were missing. This section will examine the completeness of various data points and explain how I am handling missing data.

NOTE: the `get_coverage_df` function outputs the completeness (% non-null) of key columns in the analysis. You can find it at `shared/src/shared_functions.py`.

The data overall is very incomplete and has a ton of missing values. This is largely because many of the cases sent from case management systems are not completed.

```
case_status      0.426
amount_claimed   0.521
amount_assessed  0.402
amount_paid      0.382
date_opened      0.985
date_closed      0.231
dtype: float64
```

This state breakdown heatmap shows which states have which data.



The `determine_case_outcome` task of this repo assigns a `case_decided_in_favor_of_claimant` column to the dataframe, as well as the reason why that task determined the case outcome.

		rows
case_decided_in_favor_of_claimant	True	has amount paid 237082
	False	has no amount values 178282
True	False	state only provided closed cases 60456
	True	has no assessed amount, but state provided assessed amount 49081
False	True	has assessed amount greater than 0 44684
	False	has assessed amount less than or equal to 0 37868
		has open or incomplete case status 28787
True		has final case status 13874

When you select only cases marked completed, you get much better completeness.

```
case_status      0.460
amount_claimed   0.648
amount_assessed  0.594
amount_paid      0.667
date_opened      0.976
date_closed      0.277
dtype: float64
```



Texas provided data separately. Unless the AG sides with me (I'm still awaiting a decision), they determined that the amounts were private personal financial information. They did, however, provide me a file containing only the amounts that cannot be linked to the case data. For analyses of amounts, I'll add that data separately and remove the other Texas case information.

See [shared\\_functions.py](#)

With the Texas amounts added, and incomplete cases removed, the amount fields still contain missing data but almost all cases contain at least one non-null amount.

396 rows (90.111205966930266) have no amounts

There are also indeterminate cases, in which I couldn't determine whether the case was completed

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## Analysis

Below you will find basic descriptive statistics and state breakdowns. I will expand on this in the coming days, including by making comparisons to average household income and consumer expenses. 1

I will focus on the following data points:

- overall amount assessed and the impacts that can have
- amount claimed or assessed by the state vs. the amount paid by the company
- the amount of time these cases take to resolve

All cases used in this analysis are decided in favor of the claimant unless otherwise specified.

### Overall case amounts

```
count      357092.000
mean       4583.330
std        30836.633
min         0.000
25%        200.000
50%        720.000
75%        2400.000
max       5912348.830
Name: overall_case_amount, dtype: float64
```

Total amount across all states: 1,636,670,320

	total_cases	pct_of_total_cases
overall_case_amount		
0–100	25152	0.079
100–500	85504	0.269
500–1,000	57528	0.181
1,000–2,500	63470	0.200
2,500–5,000	34698	0.109
5,000–10,000	23790	0.075
10,000–50,000	22846	0.072
50,000–100,000	2752	0.009
100,000–500,000	2006	0.006
500,000–1,000,000	102	0.000
\$1,000,000+	45	0.000

	overall_case_amount	count	mean	std	min	25%	50%	75%	max
state_name									
California	558617653.636	63442.000	8805.171	44730.691	0.000	295.025	2070.010	6955.500	5912348.830
Illinois	54807091.760	11696.000	4685.969	38133.438	0.000	288.000	960.000	2700.000	1923000.000
Indiana	39404254.013	7832.000	5031.187	51612.102	0.000	245.642	590.550	1524.862	2297378.000
Iowa	853899.630	7370.000	115.861	625.433	0.000	0.000	0.000	0.000	7625.000
Kansas	10508991.876	4931.000	2131.209	29528.906	0.440	250.000	560.000	1280.500	2019015.000
Kentucky	23838093.630	7020.000	3395.740	16168.527	25.380	207.765	398.645	1164.223	125810.820
Maine	1977300.070	792.000	2496.591	8276.580	2.750	222.040	585.750	1551.312	153993.440
Maryland	20140568.600	8290.000	2429.582	6628.096	0.000	384.000	934.470	2826.160	287701.580
Massachusetts	48474294.560	2419.000	20038.981	75475.087	0.000	857.320	2560.000	9826.160	1325287.250
Michigan	61287422.210	41752.000	1467.892	8299.871	0.000	200.248	492.580	1137.010	1000000.000
Minnesota	6559247.360	744.000	8816.193	47355.421	0.000	289.175	886.500	4312.220	1115426.880
Montana	11437534.690	5361.000	2133.470	5969.388	0.230	280.000	720.000	1767.870	167750.180
Nebraska	508919.000	563.000	903.941	2406.379	50.000	500.000	500.000	500.000	51000.000
New Hampshire	42787166.000	8200.000	5217.947	26228.588	0.000	342.000	920.000	2631.500	658292.000
New Jersey	146034669.760	25725.000	5676.761	25955.542	0.200	393.750	1101.190	3515.000	1083752.300
New York	363780038.260	52662.000	6907.828	41563.036	0.000	0.000	600.000	2775.630	4130507.510
Ohio	41043963.840	9596.000	4277.195	23145.961	0.000	0.000	390.790	1851.245	1225315.440
Rhode Island	9288775.110	2292.000	4052.694	31058.217	0.000	0.000	0.000	414.430	703623.260
South Carolina	8358985.600	4810.000	1737.835	21497.200	0.000	200.000	497.815	1171.410	1424044.000
Texas	119781779.020	63158.000	1896.542	7704.863	0.980	300.000	710.500	1602.105	628000.000
Utah	18597232.020	10103.000	1840.763	3290.260	0.000	83.190	622.100	2014.460	30411.000
Washington	13663941.420	6365.000	2146.731	6924.469	0.010	280.000	723.000	1716.660	233785.980
Wisconsin	33833405.810	11005.000	3074.367	41164.701	0.000	204.310	540.000	1365.000	2031142.800
Wyoming	1085092.920	964.000	1125.615	1629.319	3.360	252.750	578.025	1216.500	13703.660

### Amounts recovered

For Texas paid amounts, we have been told by the Texas Workforce Commission that they do not reliably track the amounts paid, but rather use a numeric status code that was included in the original data to designate if payment was made. For calculations of percentages of cases paid, we will use that status code to designate whether a case was paid, and for total amounts recovered we will use the actual paid amount field, even though it is incomplete.

	total_cases	pct_of_total_cases
True	201068	0.612
False	127564	0.388

Total amount paid: 631,838,076

	total_cases	cases_with_paid_amounts	total_amount_paid	pct_of_total_cases
state_name				
California	63442.000	26509.000	126853456.268	0.418
Indiana	8175.000	5541.000	3645489.950	0.678
Iowa	7370.000	3199.000	2617419.000	0.434
Kansas	4931.000	4931.000	10508991.876	1.000
Maine	792.000	690.000	1451891.010	0.871
Maryland	8290.000	5102.000	8346019.710	0.615
Massachusetts	2419.000	2408.000	48474294.560	0.995
Michigan	41787.000	37796.000	36834248.610	0.904
Minnesota	745.000	606.000	5319233.840	0.813
Montana	5361.000	4041.000	7312386.590	0.754
Nebraska	563.000	80.000	37324.000	0.142
New Hampshire	8200.000	3227.000	7670262.000	0.394
New Jersey	25725.000	20677.000	90118620.150	0.804
New York	52662.000	31109.000	219924360.450	0.591
Ohio	9651.000	967.000	1481679.000	0.100
Rhode Island	2292.000	1749.000	4571119.010	0.763
South Carolina	4818.000	2053.000	307040.600	0.426
Utah	10103.000	7036.000	7911044.940	0.696
Wisconsin	11011.000	9807.000	25047136.630	0.891
Texas	63158.000	33540.000	23406057.880	0.556

### Case duration

```
count      90990
mean      310 days 04:17:18.846545676
std       411 days 08:42:40.037558060
min         0 days 00:00:00
25%       185 days 00:00:00
50%       195 days 00:00:00
75%       336 days 00:00:00
max       4585 days 00:00:00
Name: case_duration, dtype: object
```

	total_cases	pct_of_total_cases
duration_days		
0-30 days	4594	0.051
30-60 days	5102	0.056
60-90 days	8383	0.092
90-180 days	24188	0.266
180-360 days	28436	0.313
360-720 days	12895	0.142
720+ days	7292	0.080

	count	mean	std	min	25%	50%	75%	max
state_name								
California	12366.000	523.836	306.061	26.000	300.000	439.000	676.750	1951.000
Kansas	4917.000	158.355	306.790	0.000	47.000	99.000	168.000	3869.000
South Carolina	4807.000	65.342	48.877	0.000	35.000	57.000	84.000	826.000
Texas	60456.000	332.287	449.349	29.000	133.000	208.000	323.000	4585.000
Washington	6364.000	55.863	55.484	0.000	22.000	43.000	69.000	1197.000
Wyoming	2080.000	99.992	137.802	0.000	24.000	48.000	124.000	1114.000

### Comparison to state felony theft thresholds

	total_cases	pct_of_total_cases
felony_theft		
False	482918	0.743
True	167307	0.257

felony_theft	False	True	total	pct
California	150618.000	39609.000	190227.000	0.208
Colorado	454.000	NaN	NaN	NaN
Illinois	7470.000	16339.000	23809.000	0.686
Indiana	12821.000	8690.000	21511.000	0.404
Iowa	7090.000	280.000	7370.000	0.038
Kansas	7171.000	3080.000	10251.000	0.300
Kentucky	3978.000	3159.000	7137.000	0.443
Maine	520.000	272.000	792.000	0.343
Maryland	5364.000	2926.000	8290.000	0.353
Massachusetts	802.000	1618.000	2420.000	0.669
Michigan	58677.000	24347.000	83024.000	0.293
Minnesota	773.000	354.000	1127.000	0.314
Montana	5336.000	2722.000	8058.000	0.338
Nebraska	530.000	49.000	579.000	0.085
New Hampshire	4319.000	4107.000	8426.000	0.487
New Jersey	3606.000	22119.000	25725.000	0.860
New York	40212.000	21648.000	61860.000	0.350
Ohio	14468.000	3328.000	17796.000	0.187
Rhode Island	1955.000	341.000	2296.000	0.149
South Carolina	13944.000	680.000	14624.000	0.046
Texas	60456.000	NaN	NaN	NaN
Utah	15258.000	6418.000	21676.000	0.296
Washington	34523.000	3127.000	37650.000	0.083
West Virginia	3778.000	NaN	NaN	NaN
Wisconsin	26880.000	1787.000	28667.000	0.062
Wyoming	1915.000	307.000	2222.000	0.138
total	482918.000	167307.000	650225.000	0.257