



UNIVERSITY OF  
CALGARY

# Canada Nursing Workforce Analysis

□ Frank Kwaku Kuukyee

# Analyzing Nursing Workforce Distribution

- **Task:** Analyze the distribution of the regulated nursing workforce employed in direct care based on place of work, type of professional, and jurisdiction of registration from 2013 to 2022
- **Datasets:**
  - Table 3: Regulated nursing workforce employed in direct care, by health region and jurisdiction, provinces/territories with available data, 2013–2022.
  - Table 1: Supply of regulated nurses by type of nurses profession, Canada, 2013 to 2021.

# Dataset Cleaning – Table 3 [ before ]

Province/territory	Health region	Nurse practitioners									
		2014	2015	2016	2017	2018	2019	2020	2021	2022	
Saskatchewan	Keewatin Health Region	10	12	10	10	10	11	11	10	10	
Saskatchewan	Prince Albert Parkland Health Region	16	20	20	23	28	30	19	19	23	
Saskatchewan	Prairie North Health Region	12	13	16	18	18	17	14	12	14	
Saskatchewan	Mamawetan Churchill River Health Region	5	5	6	3	5	10	8	8	9	
Saskatchewan	Keewatin Yatthé Health Region	9	8	6	9	7	10	6	7	7	
Saskatchewan	Athabasca Health Authority	2	2	2	2	2	3	5	6	5	
Alberta	Alberta (regional health authorities)	287	320	398	424	475	530	549	573	581	
Alberta	South Zone	5	7	9	10	13	14	18	18	19	
Alberta	Calgary Zone	86	100	143	158	173	192	203	202	206	
Alberta	Central Zone	5	3	11	14	17	20	20	23	30	
Alberta	Edmonton Zone	171	197	204	218	239	271	271	292	285	
Alberta	North Zone	12	12	26	24	33	33	37	38	40	
British Columbia	British Columbia (health service delivery areas)	225	202	224	309	343	420	485	577	665	
British Columbia	East Kootenay HSDA	2	4	1	5	4	4	4	6	9	
British Columbia	Kootenay–Boundary HSDA	3	5	2	5	6	9	10	10	9	
British Columbia	Okanagan HSDA	10	13	13	23	31	30	37	49	51	
British Columbia	Thompson/Cariboo HSDA	7	9	12	22	21	24	23	27	30	
British Columbia	Fraser East HSDA	6	8	9	18	17	30	33	35	42	
British Columbia	Fraser North HSDA	22	19	19	23	32	26	41	51	62	
British Columbia	Fraser South HSDA	23	17	23	30	30	44	52	57	63	
British Columbia	Richmond HSDA	2	0	1	1	1	2	3	4	10	
British Columbia	Vancouver HSDA	79	69	83	94	106	121	137	179	185	
British Columbia	North Shore/Coast Garibaldi HSDA	6	5	9	10	14	20	24	21	29	
British Columbia	South Vancouver Island HSDA	20	16	14	28	25	32	44	45	60	
British Columbia	Central Vancouver Island HSDA	12	8	9	15	24	27	26	38	45	
British Columbia	North Vancouver Island HSDA	10	9	11	11	10	13	14	12	15	

Only the "Nurse practitioners" data is shown in this screenshot; the remaining data, which includes licensed practical nurses, registered psychiatric nurses, and registered nurses, is to the right of this data and is not visible in the screenshot.

# Dataset Cleaning – Table 3 [ after ]

Year	Province	Region	nurse_practitioners	registered_nurses	registered_psychiatric_nurses	licensed_practical_nurses
2013	Newfoundland and Labrador	Eastern Health	61	3439	0	1165
2013	Newfoundland and Labrador	Central Health	27	679	0	449
2013	Newfoundland and Labrador	Western Health	10	770	0	428
2013	Newfoundland and Labrador	Labrador-Grenfell Health	13	361	0	166
2013	Prince Edward Island	Prince Edward Island	4	1364	0	591
2013	Prince Edward Island	Health PEI	4	1348	0	591
2013	Nova Scotia	Western Zone	25	1275	0	919
2013	Nova Scotia	Northern Zone	16	999	0	541
2013	Nova Scotia	Eastern Zone	18	1651	0	917
2013	Nova Scotia	Central Zone	65	3957	0	1299
2013	New Brunswick	Zone 1 (Moncton Area)	25	1980	0	562
2013	New Brunswick	Zone 2 (Saint John Area)	29	1715	0	702
2013	New Brunswick	Zone 3 (Fredericton Area)	20	1349	0	563
2013	New Brunswick	Zone 4 (Edmundston Area)	5	520	0	215
2013	New Brunswick	Zone 5 (Campbellton Area)	3	394	0	176
2013	New Brunswick	Zone 6 (Bathurst Area)	10	733	0	378
2013	New Brunswick	Zone 7 (Miramichi Area)	6	399	0	158
2013	Quebec	Bas-Saint-Laurent Region	5	1650	0	724
2013	Quebec	Saquesnay-Lac-Saint-Je...	5	2348	0	992



# Dataset Cleaning – Table 1 [ before ]

Year	Jurisdiction	Type of professional	Supply: number of nurses	Supply: inflow	Supply: outflow	Supply: renewal	Supply: inflow, age younger than 35	Supply: inflow, age 35 to 54
2013	Newfoundland and Labrador	Nurse practitioners	124	11	4	113	1	9
2013	Prince Edward Island	Nurse practitioners	6	3	1	3	2	0
2013	Nova Scotia	Nurse practitioners	138	9	7	129	1	6
2013	New Brunswick	Nurse practitioners	107	8	7	99	6	2
2013	Quebec	Nurse practitioners	202	54	5	148	37	17
2013	Ontario	Nurse practitioners	2,158	251	81	1,907	124	116
2013	Manitoba	Nurse practitioners	107	13	3	94	6	6
2013	Saskatchewan	Nurse practitioners	158	26	8	132	9	15
2013	Alberta	Nurse practitioners	335	40	9	295	19	18
2013	British Columbia	Nurse practitioners	253	39	15	214	13	23
2013	Yukon	Nurse practitioners	5	—	1	—	—	—
2013	Northwest Territories/Nunavut	Nurse practitioners	63	12	†	51	†	†

# Dataset Cleaning – Table 1 [ after ]

Year	Place of Work	Jurisdiction of Registration	nurse_practitioners	registered_nurses	registered_psychiatric_nurses	licensed_practical_nurses	Total_nurses
2013	Eastern Health	Newfoundland and Labrador	61	3439	0	1165	4665
2013	Eastern Health	Newfoundland and Labrador	61	3439	0	1165	4665
2013	Eastern Health	Newfoundland and Labrador	61	3439	0	1165	4665
2013	Central Health	Newfoundland and Labrador	27	679	0	449	1155
2013	Central Health	Newfoundland and Labrador	27	679	0	449	1155
2013	Central Health	Newfoundland and Labrador	27	679	0	449	1155
2013	Western Health	Newfoundland and Labrador	10	770	0	428	1208
2013	Western Health	Newfoundland and Labrador	10	770	0	428	1208

# Data extraction

Limit to 1000 rows

```

1 • SELECT Year, Province, Region AS 'Health Region', nurse_practitioners, registered_nurses, registered_psychiatric_nurses, licensed_practical_nurses,
2   nurse_practitioners + registered_nurses + registered_psychiatric_nurses + licensed_practical_nurses AS Total_nurses
3   FROM project.table3;
4

```

Result Grid

Year	Province	Health Region	nurse_practitioners	registered_nurses	registered_psychiatric_nurses	licensed_practical_nurses	Total_nurses
2022	Alberta	South Zone	19	2246	34	1048	3347
2022	Alberta	Calgary Zone	206	12593	192	4488	17479
2022	Alberta	Central Zone	30	3035	312	1816	5193
2022	Alberta	Edmonton Zone	285	11986	489	5170	17930
2022	Alberta	North Zone	40	2215	47	1317	3619
2022	British Columbia	East Kootenay HSDA	9	533	15	256	813
2022	British Columbia	Kootenay&#x2013;Boundary HSDA	9	596	35	181	821
2022	British Columbia	Okanagan HSDA	51	3079	209	1471	4810
2022	British Columbia	Thompson/Cariboo HSDA	30	1581	151	681	2443
2022	British Columbia	Fraser East HSDA	42	1961	241	890	3134

Result 3 x

Read Only

# Data extraction contd.

Limit to 1000 rows

```

3 • select
4     Year, Jurisdiction, supply_number_of_nurses, supply_inflow, supply_outflow, supply_renewal,
5     supply_inflow-supply_outflow+supply_renewal AS Net_supply
6 FROM project.table1;
7

```

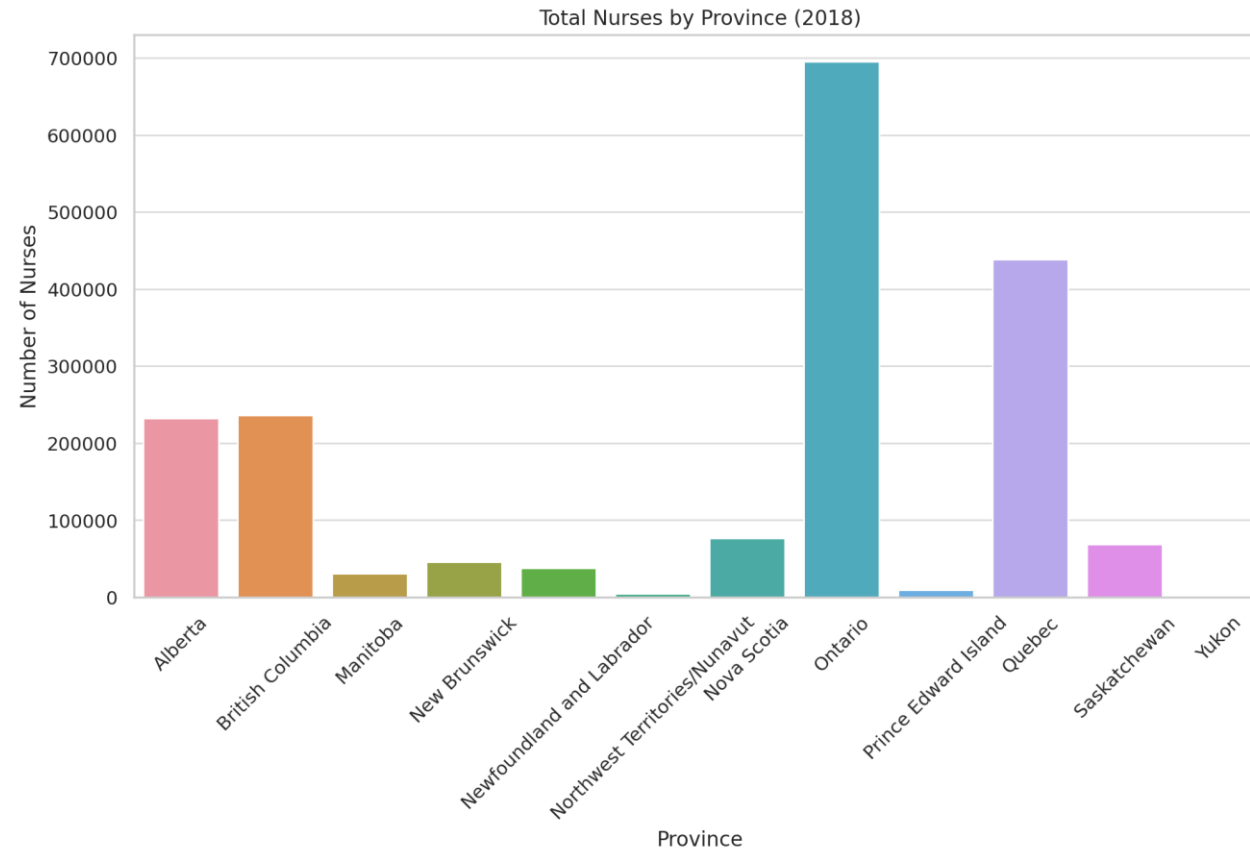
Result Grid

	Year	Jurisdiction	supply_number_of_nurses	supply_inflow	supply_outflow	supply_renewal	Net_supply
▶	2013	Newfoundland and Labrador	124	11	4	113	120
	2013	Prince Edward Island	6	3	1	3	5
	2013	Nova Scotia	138	9	7	129	131
	2013	New Brunswick	107	8	7	99	100
	2013	Quebec	202	54	5	148	197
	2013	Ontario	2158	251	81	1907	2077
	2013	Manitoba	107	13	3	94	104
	2013	Saskatchewan	158	26	8	132	150
	2013	Alberta	335	40	9	295	326
	2013	British Columbia	253	39	15	214	238

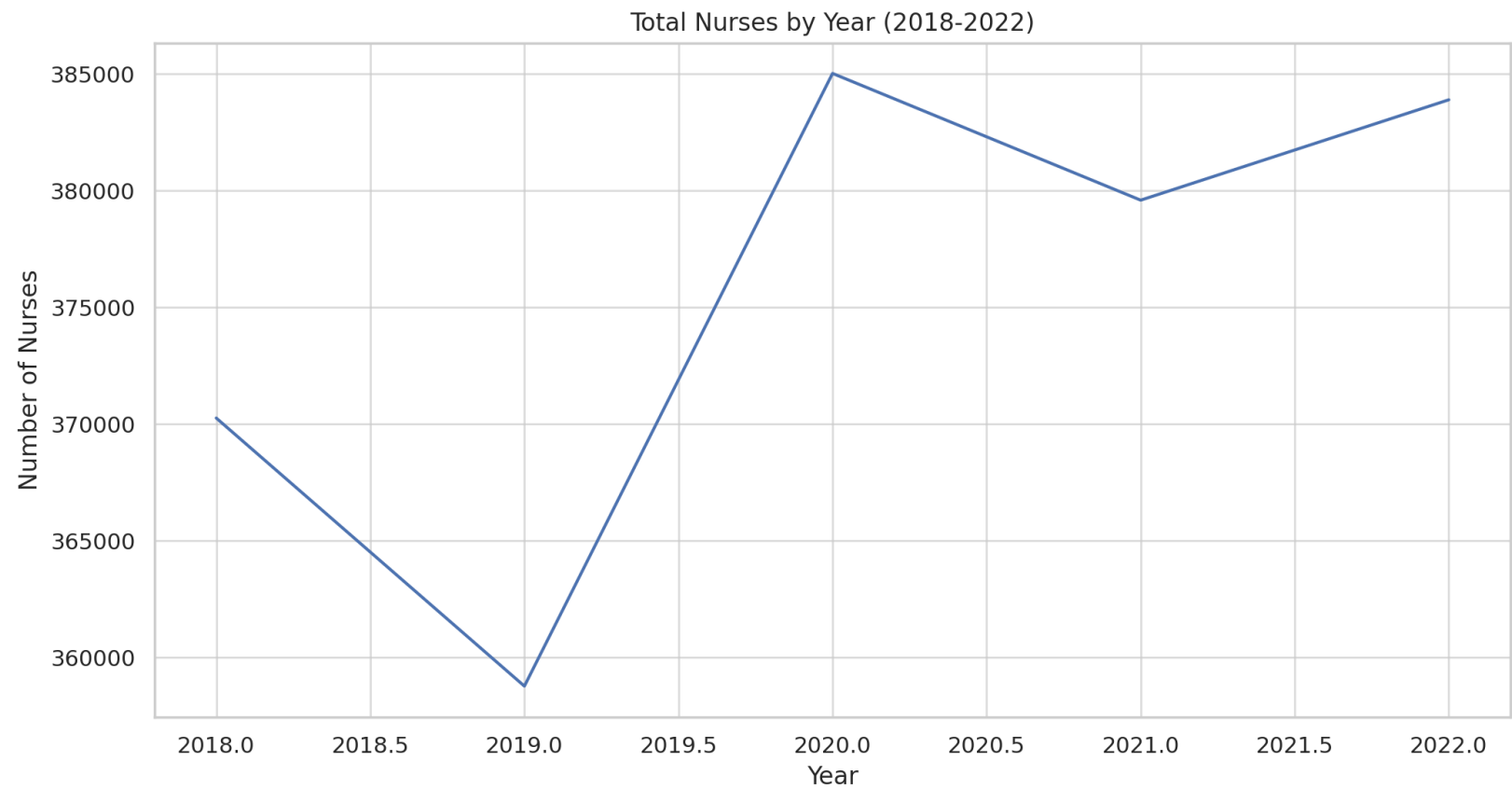
Result 4



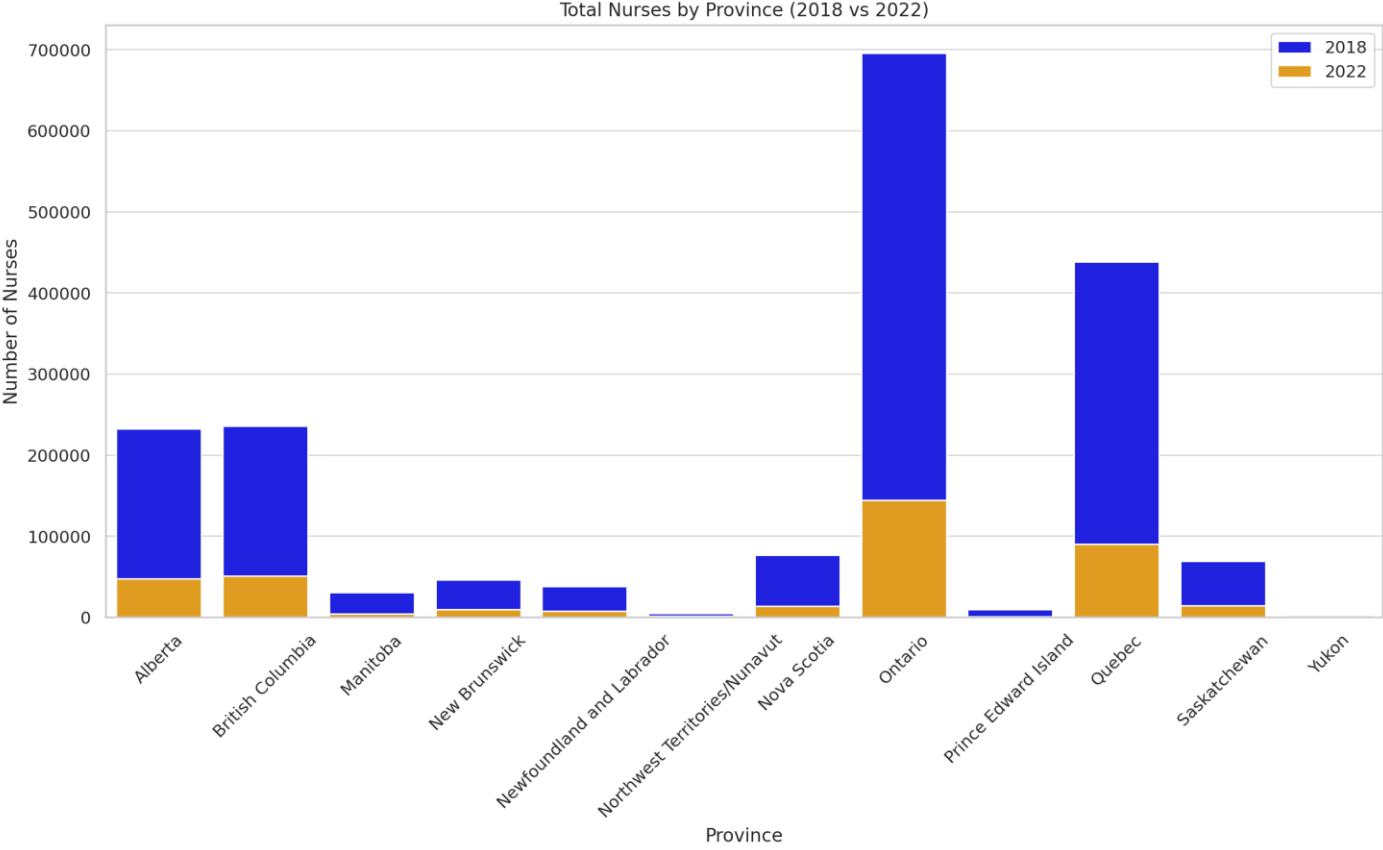
# Visualisation



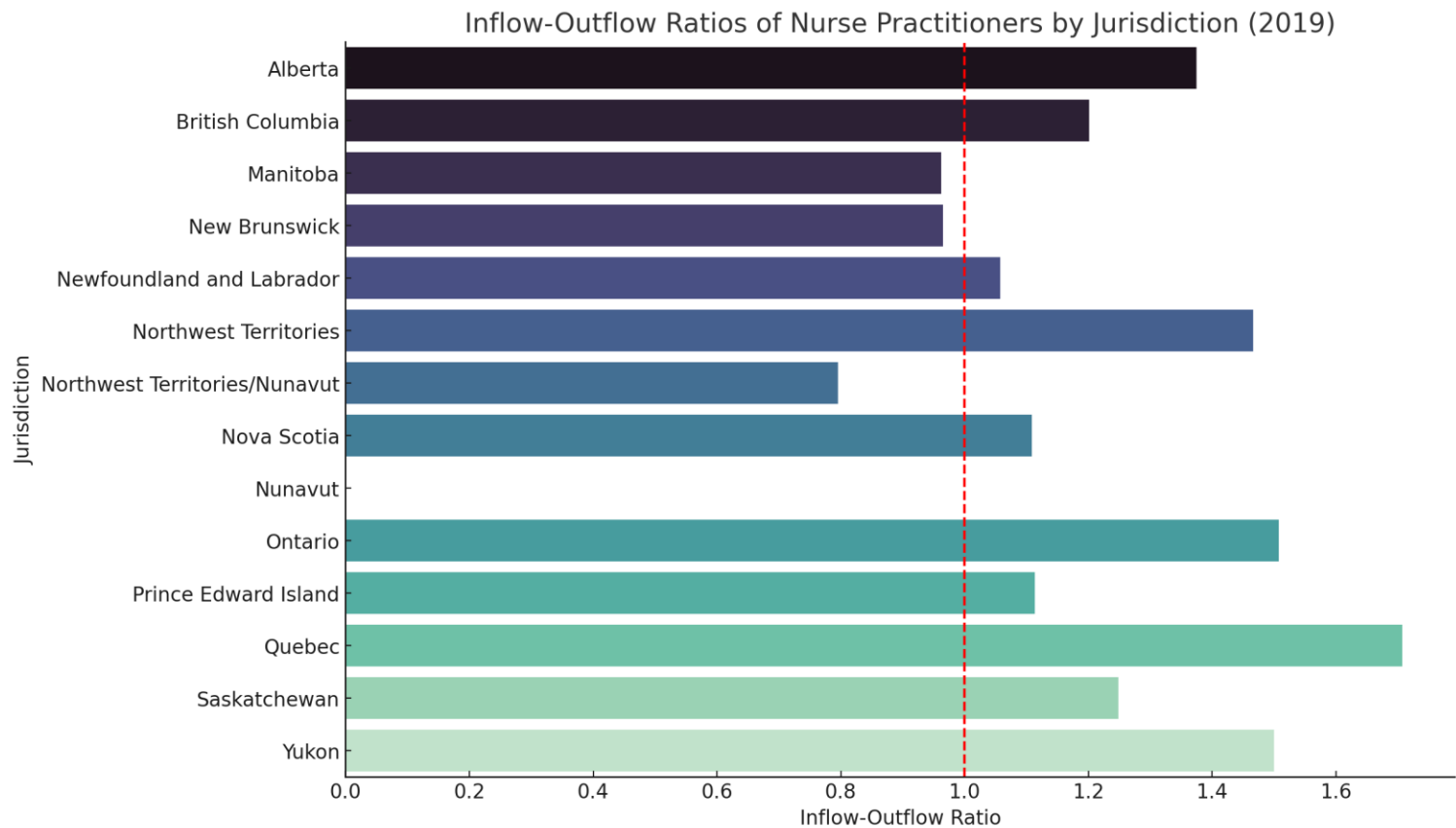
# Visualisation contd



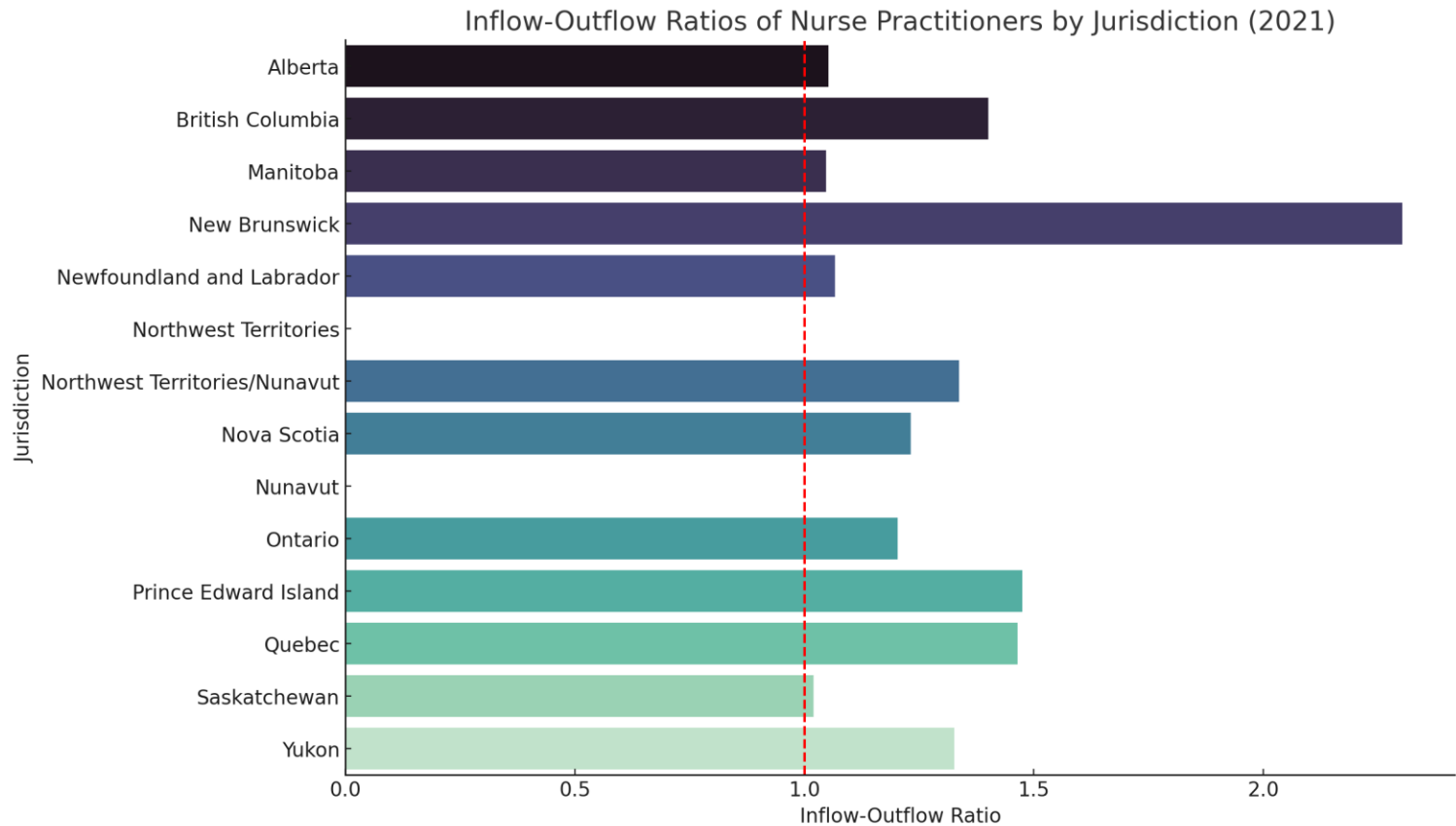
# Visualisation contd



# Visualisation contd



# Visualisation contd



# Findings

- Provincial Variations: Some provinces, such as Ontario and Quebec, show a significant increase in the number of nurses.
- The relative rankings of provinces in terms of nursing numbers seem consistent between 2018 and 2022, with Ontario, Quebec, and Alberta remaining the top three in both years.

## Findings cont.

- The year-over-year changes :
  - 2018 to 2019: a decrease of 11,490 nurses.
  - 2019 to 2020: an increase of 26,259 nurses.
  - 2020 to 2021: a decrease of 5,432 nurses.
  - From 2021 to 2022: an increase of 4,302 nurses.

- Percentage Change in Inflow-Outflow of Nurses 2019
  - Alberta: 37.46% increase
  - British Columbia: 20.09% increase
  - Manitoba: 3.73% decrease
  - New Brunswick: 3.48% decrease
  - Newfoundland and Labrador: 5.72% increase



- Percentage Change in Inflow-Outflow of Nurses 2021
  - Alberta: 5.29% increase
  - British Columbia: 40.11% increase
  - Manitoba: 4.76% increase
  - New Brunswick: 130.32% increase
  - Newfoundland and Labrador: 6.68% increase