Supplemental Materials for Online Publication Only

A. A summary of data manipulations

With some manual work and the use of excel and R, the following steps are repeated for the raw data downloaded from the websites of state Attorneys General:

- Extract the earliest possible date of breach occurrence.
- Select breaches within the time periods for which complete and unbiased data are available.
- Examine breaches with negative reporting delay and correct the misrecorded dates.
- Delete observations with no date of breach/organisation name/reported date/unknown number of state residents affected/ineligible breaches (i.e., the number of state residents affected is below the threshold that triggers the notification obligation).
- Examine duplicate entries regarding the same breach. Update the original notice by the information provided by supplementary notices, and then delete supplementary notices.

Assumptions are made for some special entries. For example, the occurrence date recorded as 'mid Dec. 2019' is assumed to be December 15 2019. Upon submission, all details will be provided for replication purposes.

B. Quarterly Run-off Triangles

AQ and DQ will be used as abbreviations for accident quarter and development quarter. Most numerous cases are displayed first.

Table A: Quarterly Run-off Triangle of the number of data breaches that affect more than 500 California residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	DQ26	DQ27	DQ28	DQ29	DQ30	DQ31	DQ32	DQ33	DQ34	DQ35	DQ36	DQ37	DQ38	DQ39	DQ40	Sum
AQ2012Q1	7	10	3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
AQ2012Q2	9	13	2	0	3	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
AQ2012Q3	11	11	3	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27
AQ2012Q4	15	15	3	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	37
AQ2013Q1	9	7	7	4	0	3	2	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35
AQ2013Q2	11	9	6	1	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
AQ2013Q3	13	16	1	5	2	0	0	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	41
AQ2013Q4	14	7	3	4	0	1	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33
AQ2014Q1	13	11	3	0	1	1	1	0	1	2	0	0	0	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36
AQ2014Q2	14	18	9	3	3	6	2	2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
AQ2014Q3	8	8	3	2	3	1	1	1	0	0	0	2	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
AQ2014Q4	16	9	6	2	4	3	0	0	0	2	0	1	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46
AQ2015Q1	14	18	5	2	1	1	1	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
AQ2015Q2	14	13	4	1	1	4	0	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
AQ2015Q3	8	13	7	0	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33
AQ2015Q4	5	15	3	13	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	42
AQ2016Q1	21	18	9	1	5	3	2	1	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	62
AQ2016Q2	16	17	7	3	4	3	3	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	56
AQ2016Q3	14	23	4	5	26	2	0	1	0	0	1	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78
AQ2016Q4	15	15	6	3	3	1	0	0	2	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
AQ2017Q1	27	25	8	5	2	1	3	3	0	1	0	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	78
AQ2017Q2	19	17	8	7	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
AQ2017Q3	14	21	6	8	3	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	54
AQ2017Q4	19	20	15	7	7	0	1	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	73
AQ2018Q1	14	24	12	2	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
AQ2018Q2	13	8	19	13	2	1	1	0	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
AQ2018Q3	8	23	14	8	8	1	2	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	66
AQ2018Q4	14	11	13	4	3	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
AQ2019Q1	13	21	9	8	1	1	2	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	58
AQ2019Q2	12	14	7	8	3	2	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
AQ2019Q3	6	23	11	5	6	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	53
AQ2019Q4	8	14	34	13	3	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	79
AQ2020Q1	8	23	30	21	13	5	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	102
AQ2020Q2	21	51	18	12	11	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	119
AQ2020Q3	7	36	17	9	8	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	80
AQ2020Q4	13	38	23	14	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	92
AQ2021Q1	21	48	22	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
AQ2021Q2	12	26	17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
AQ2021Q3	15	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	65
AQ2021Q4	18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
Sum	529	759	377	208	141	57	41	22	9	14	7	9	3	5	2	1	4	1	3	0	2	0	0	1	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	2198

Table B: Quarterly Run-off Triangle of the number of data breaches that affect between 0 and 249 Indiana residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	DQ26	DQ27	DQ28	DQ29	DQ30	Sum
AQ2014Q1	39	26	8	4	4	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84
AQ2014Q2	37	32	5	2	2	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	82
AQ2014Q3	18	27	4	2	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	57
AQ2014Q4	52	18	9	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83
AQ2015Q1	39	26	4	3	1	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	78
AQ2015Q2	64	40	7	3	1	0	0	0	0	1	0	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
AQ2015Q3	33	29	10	0	0	1	1	0	0	2	0	2	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	81
AQ2015Q4	41	42	12	4	0	1	1	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
AQ2016Q1	99	77	5	9	10	2	2	0	0	1	0	1	1	0	0	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	210
AQ2016Q2	80	55	5	2	7	1	0	3	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	157
AQ2016Q3	43	42	9	11	43	1	0	0	0	0	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	152
AQ2016Q4	42	29	12	4	2	2	1	0	1	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95
AQ2017Q1	160	79	18	6	1	4	0	4	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	277
AQ2017Q2	63	36	10	7	5	1	0	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125
AQ2017Q3	58	35	11	13	5	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	125
AQ2017Q4	15	43	24	10	3	0	3	4	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
AQ2018Q1	95	84	21	10	5	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	219
AQ2018Q2	52	51	30	21	8	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	166
AQ2018Q3	67	70	29	12	4	3	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	190
AQ2018Q4	57	58	39	17	5	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
AQ2019Q1	73	78	39	9	5	5	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	213
AQ2019Q2	58	74	25	19	6	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	188
AQ2019Q3	53	52	44	16	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	175
AQ2019Q4	14	53	42	19	8	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	140
AQ2020Q1	63	101	68	65	40	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	341
AQ2020Q2	50	103	94	41	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	300
AQ2020Q3	51	98	58	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	233
AQ2020Q4	69	99	76	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	244
AQ2021Q1	56	127	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	183
AQ2021Q2	61	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	61
Sum	1702	1684	718	337	184	43	24	22	9	12	4	5	5	2	2	5	1	0	3	1	1	0	1	0	0	0	1	1	0	0	4767

Table C: Quarterly Run-off Triangle of the number of data breaches that affect between 0 and 249 Montana residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	Sum
AQ2015Q4	16	20	7	5	1	1	1	1	1	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	55
AQ2016Q1	38	36	3	2	17	6	4	1	2	0	0	0	2	0	0	0	0	0	1	0	0	0	0	0	0	112
AQ2016Q2	26	30	6	4	5	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	81
AQ2016Q3	25	36	4	4	39	7	1	1	0	0	1	1	0	0	0	0	1	0	0	0	2	0	0	0	0	122
AQ2016Q4	24	24	7	6	3	2	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	69
AQ2017Q1	49	41	6	5	4	0	2	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114
AQ2017Q2	25	25	6	2	3	0	1	1	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	66
AQ2017Q3	23	21	6	7	3	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	63
AQ2017Q4	9	25	14	8	8	1	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	68
AQ2018Q1	35	31	14	8	5	2	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	98
AQ2018Q2	27	40	24	16	3	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	112
AQ2018Q3	13	45	22	9	12	0	2	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	106
AQ2018Q4	26	36	27	3	4	0	2	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	100
AQ2019Q1	25	58	31	9	3	1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	130
AQ2019Q2	30	43	24	12	3	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	115
AQ2019Q3	16	52	31	14	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	120
AQ2019Q4	23	45	24	11	7	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	114
AQ2020Q1	24	60	62	54	37	13	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	253
AQ2020Q2	26	61	52	19	14	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	180
AQ2020Q3	15	66	44	18	9	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	159
AQ2020Q4	42	74	51	27	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	203
AQ2021Q1	21	89	47	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	176
AQ2021Q2	29	78	43	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	150
AQ2021Q3	21	75	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	96
AQ2021Q4	25	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
Sum	633	1111	555	262	193	60	25	17	10	4	4	1	4	0	0	2	2	0	1	0	3	0	0	0	0	2887

Table D: Quarterly Run-off Triangle of the number of data breaches that affect between 0 and 249 Maine residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	DQ26	DQ27	DQ28	DQ29	DQ30	Sum
AQ2013Q1	26	15	1	0	0	2	0	1	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	48
AQ2013Q2	30	18	3	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
AQ2013Q3	16	7	3	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	31
AQ2013Q4	31	11	2	2	2	0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	51
AQ2014Q1	13	16	4	2	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38
AQ2014Q2	12	11	3	3	2	2	0	2	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	38
AQ2014Q3	8	12	2	1	1	0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0	0	29
AQ2014Q4	30	21	6	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	59
AQ2015Q1	21	11	4	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	41
AQ2015Q2	20	17	5	1	0	2	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
AQ2015Q3	22	15	5	0	0	2	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	47
AQ2015Q4	22	21	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	55
AQ2016Q1	53	34	5	3	7	4	1	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	110
AQ2016Q2	47	28	3	3	4	2	1	3	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94
AQ2016Q3	30	27	3	14	27	1	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	104
AQ2016Q4	26	23	3	4	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	60
AQ2017Q1	63	24	10	5	3	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	109
AQ2017Q2	50	25	10	4	4	1	0	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	99
AQ2017Q3	45	25	6	9	3	0	3	1	2	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	95
AQ2017Q4	20	20	14	9	2	3	1	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	75
AQ2018Q1	28	37	8	3	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86
AQ2018Q2	28	22	15	14	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	86
AQ2018Q3	18	28	24	13	8	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94
AQ2018Q4	8	46	24	8	6	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	94
AQ2019Q1	25	41	24	11	2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	108
AQ2019Q2	18	41	20	17	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	100
AQ2019Q3	14	33	25	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	83
AQ2019Q4	18	24	29	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	71
AQ2020Q1	20	57	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	77
AQ2020Q2	28	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
Sum	790	710	269	149	90	31	15	20	8	10	2	4	4	3	2	0	2	0	1	0	2	0	0	0	0	0	0	0	0	0	2112

Table E: Quarterly Run-off Triangle of the number of data breaches that affect more than 500 Washington residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	Sum
AQ2015Q4	1	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
AQ2016Q1	2	1	3	1	12	4	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	25
AQ2016Q2	2	3	1	2	0	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
AQ2016Q3	3	1	0	4	5	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	14
AQ2016Q4	1	4	4	2	2	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	14
AQ2017Q1	4	4	0	2	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	12
AQ2017Q2	1	4	4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
AQ2017Q3	2	4	1	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
AQ2017Q4	1	3	5	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
AQ2018Q1	1	0	2	1	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
AQ2018Q2	1	3	5	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	12
AQ2018Q3	0	6	0	2	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
AQ2018Q4	4	4	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
AQ2019Q1	2	5	5	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AQ2019Q2	2	6	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	13
AQ2019Q3	1	4	4	1	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AQ2019Q4	4	3	4	3	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
AQ2020Q1	0	2	87	22	4	5	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	121
AQ2020Q2	3	15	4	5	4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	34
AQ2020Q3	5	7	6	3	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
AQ2020Q4	4	12	7	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	26
AQ2021Q1	6	16	7	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	33
AQ2021Q2	6	4	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AQ2021Q3	4	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AQ2021Q4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Sum	67	125	160	63	50	19	6	2	2	2	1	2	0	1	1	0	0	0	1	0	0	0	0	0	0	502

Table F: Quarterly Run-off Triangle of the number of data breaches that affect more than 250 Oregon residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	Sum
AQ2016Q1	0	9	4	2	12	6	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	35
AQ2016Q2	3	7	1	1	1	1	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	18
AQ2016Q3	2	7	1	1	5	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	18
AQ2016Q4	6	3	1	2	2	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	17
AQ2017Q1	5	5	3	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
AQ2017Q2	6	8	4	2	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	22
AQ2017Q3	3	4	3	4	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
AQ2017Q4	3	5	6	3	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
AQ2018Q1	2	3	6	3	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
AQ2018Q2	7	6	10	1	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	26
AQ2018Q3	2	8	4	4	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21
AQ2018Q4	4	4	10	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	20
AQ2019Q1	2	5	4	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AQ2019Q2	5	13	5	2	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	28
AQ2019Q3	5	3	5	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
AQ2019Q4	8	5	3	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
AQ2020Q1	5	4	11	5	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	30
AQ2020Q2	3	13	12	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	35
AQ2020Q3	3	10	4	2	8	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	29
AQ2020Q4	2	12	6	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	24
AQ2021Q1	10	22	10	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	46
AQ2021Q2	6	10	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25
AQ2021Q3	5	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16
AQ2021Q4	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
Sum	104	177	122	54	50	20	6	2	3	2	2	2	0	0	1	0	1	1	1	0	0	0	0	0	548

Table G: Quarterly Run-off Triangle of the number of data breaches that affect more than 500 Indiana residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	DQ26	DQ27	DQ28	DQ29	DQ30	Sum
AQ2014Q1	0	2	0	0	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2014Q2	2	2	1	2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
AQ2014Q3	0	2	0	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2014Q4	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2015Q1	4	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2015Q2	2	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	6
AQ2015Q3	0	3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2015Q4	2	6	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
AQ2016Q1	2	3	1	1	4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	12
AQ2016Q2	3	2	1	2	1	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
AQ2016Q3	1	3	0	2	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
AQ2016Q4	2	4	1	2	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
AQ2017Q1	7	7	1	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
AQ2017Q2	5	5	4	2	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
AQ2017Q3	2	2	2	2	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
AQ2017Q4	2	4	4	3	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19
AQ2018Q1	0	5	2	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
AQ2018Q2	2	6	4	0	2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AQ2018Q3	1	5	3	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14
AQ2018Q4	3	10	4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
AQ2019Q1	4	3	5	1	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15
AQ2019Q2	3	4	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
AQ2019Q3	1	3	3	3	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
AQ2019Q4	2	3	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
AQ2020Q1	3	3	9	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22
AQ2020Q2	9	12	9	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	36
AQ2020Q3	3	7	7	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
AQ2020Q4	3	11	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	17
AQ2021Q1	7	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	18
AQ2021Q2	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
Sum	82	132	71	38	32	13	4	1	1	2	2	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	0	0	0	382

Table H: Quarterly Run-off Triangle of the number of data breaches that affect between 250 and 499 Indiana residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	DQ26	DQ27	DQ28	DQ29	DQ30	Sum
AQ2014Q1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2014Q2	3	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2014Q3	0	0	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2014Q4	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2015Q1	0	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2015Q2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2015Q3	1	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2015Q4	0	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2016Q1	2	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2016Q2	2	4	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
AQ2016Q3	1	5	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
AQ2016Q4	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2017Q1	4	2	1	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	9
AQ2017Q2	0	4	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2017Q3	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2017Q4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2018Q1	2	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2018Q2	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2018Q3	1	4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
AQ2018Q4	0	2	3	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2019Q1	1	2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2019Q2	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2019Q3	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2019Q4	1	0	2	1	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
AQ2020Q1	2	3	8	6	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20
AQ2020Q2	1	8	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
AQ2020Q3	0	2	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2020Q4	3	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11
AQ2021Q1	1	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
AQ2021Q2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Sum	31	64	37	19	9	2	5	1	1	1	0	1	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	173

Table I: Quarterly Run-off Triangle of the number of data breaches that affect more than 500 Montana residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	Sum
AQ2015Q4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2016Q1	1	2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	6
AQ2016Q2	0	3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2016Q3	2	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2016Q4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2017Q1	1	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2017Q2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2017Q3	0	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2017Q4	0	1	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2018Q1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2018Q2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2018Q3	1	2	0	3	2	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10
AQ2018Q4	0	3	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2019Q1	0	1	2	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2019Q2	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2019Q3	2	0	2	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
AQ2019Q4	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2020Q1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2020Q2	1	3	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
AQ2020Q3	1	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2020Q4	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2021Q1	2	2	6	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	12
AQ2021Q2	4	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7
AQ2021Q3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2021Q4	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
Sum	28	29	28	15	11	3	1	1	1	2	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	120

Table J: Quarterly Run-off Triangle of the number of data breaches that affect between 250 and 499 Montana residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	Sum
AQ2015Q4	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2016Q1	3	1	1	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
AQ2016Q2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2016Q3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2016Q4	1	1	0	0	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	4
AQ2017Q1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2017Q2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2017Q3	0	1	0	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2017Q4	1	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2018Q1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2018Q2	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
AQ2018Q3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2018Q4	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2019Q1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2019Q2	1	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2019Q3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2019Q4	1	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2020Q1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2020Q2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2020Q3	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2020Q4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2021Q1	2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2021Q2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2021Q3	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2021Q4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum	14	22	11	5	4	2	1	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	61

Table K: Quarterly Run-off Triangle of the number of data breaches that affect more than 500 Maine residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	DQ26	DQ27	DQ28	DQ29	DQ30	Sum
AQ2013Q1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2013Q2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2013Q3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2013Q4	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2014Q1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2014Q2	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2014Q3	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2014Q4	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2015Q1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2015Q2	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2015Q3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2015Q4	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2016Q1	1	1	1	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2016Q2	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2016Q3	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2016Q4	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2017Q1	1	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2017Q2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2017Q3	0	1	1	3	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2017Q4	0	1	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2018Q1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2018Q2	1	3	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2018Q3	1	2	0	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2018Q4	2	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5
AQ2019Q1	0	3	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2019Q2	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2019Q3	0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2019Q4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2020Q1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2020Q2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
Sum	20	36	9	11	5	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	84

Table L: Quarterly Run-off Triangle of the number of data breaches that affect between 250 and 499 Maine residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	DQ16	DQ17	DQ18	DQ19	DQ20	DQ21	DQ22	DQ23	DQ24	DQ25	DQ26	DQ27	DQ28	DQ29	DQ30	Sum
AQ2013Q1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2013Q2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2013Q3	1	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2013Q4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2014Q1	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2014Q2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2014Q3	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2014Q4	2	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2015Q1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2015Q2	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	2
AQ2015Q3	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2015Q4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2016Q1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2016Q2	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2016Q3	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2016Q4	0	1	0	0	1	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2017Q1	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2017Q2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2017Q3	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2017Q4	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2018Q1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2018Q2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2018Q3	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2018Q4	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2019Q1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2019Q2	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2
AQ2019Q3	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2019Q4	2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2020Q1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
AQ2020Q2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sum	15	10	8	5	5	2	1	1	0	2	0	0	0	0	2	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	52

Table M: Quarterly Run-off Triangle of the number of data breaches that affect more than 500 North Dakota residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	Sum
AQ2019Q1	1	2	2	0	0	0	0	0	0	0	0	0	5
AQ2019Q2	2	1	0	1	0	0	0	0	0	0	0	0	4
AQ2019Q3	1	0	0	1	1	0	0	1	0	0	0	0	4
AQ2019Q4	1	0	0	0	1	0	0	1	0	0	0	0	3
AQ2020Q1	0	2	18	8	1	0	0	0	0	0	0	0	29
AQ2020Q2	1	5	1	0	1	2	0	0	0	0	0	0	10
AQ2020Q3	2	1	2	0	1	0	0	0	0	0	0	0	6
AQ2020Q4	0	3	0	1	0	0	0	0	0	0	0	0	4
AQ2021Q1	2	3	5	1	0	0	0	0	0	0	0	0	11
AQ2021Q2	3	3	1	0	0	0	0	0	0	0	0	0	7
AQ2021Q3	1	3	0	0	0	0	0	0	0	0	0	0	4
AQ2021Q4	3	0	0	0	0	0	0	0	0	0	0	0	3
Sum	17	23	29	12	5	2	0	2	0	0	0	0	90

Table N: Quarterly Run-off Triangle of the number of data breaches that affect between 250 and 499 North Dakota residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	Sum
AQ2019Q1	0	0	0	1	0	0	0	0	1	0	0	0	2
AQ2019Q2	2	0	2	0	0	0	0	0	0	0	0	0	4
AQ2019Q3	0	1	2	0	0	0	0	0	0	0	0	0	3
AQ2019Q4	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2020Q1	0	0	5	2	2	0	0	0	0	0	0	0	9
AQ2020Q2	1	1	0	0	0	0	0	0	0	0	0	0	2
AQ2020Q3	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2020Q4	0	2	1	0	0	0	0	0	0	0	0	0	3
AQ2021Q1	0	1	0	0	0	0	0	0	0	0	0	0	1
AQ2021Q2	1	0	2	0	0	0	0	0	0	0	0	0	3
AQ2021Q3	0	0	0	0	0	0	0	0	0	0	0	0	0
AQ2021Q4	1	0	0	0	0	0	0	0	0	0	0	0	1
Sum	5	5	12	3	2	0	0	0	1	0	0	0	28

Table O: Quarterly Run-off Triangle of the number of data breaches that affect more than 500 Delaware residents

	DQ1	DQ2	DQ3	DQ4	DQ5	DQ6	DQ7	DQ8	DQ9	DQ10	DQ11	DQ12	DQ13	DQ14	DQ15	Sum
AQ2018Q2	0	1	1	0	1	0	0	0	0	0	0	0	0	0	0	3
AQ2018Q3	2	0	0	1	0	1	0	0	0	0	0	0	0	0	0	4
AQ2018Q4	0	1	1	2	0	0	0	0	0	0	0	0	0	0	0	4
AQ2019Q1	1	2	3	0	0	0	0	0	0	0	0	0	0	0	0	6
AQ2019Q2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	4
AQ2019Q3	1	1	0	0	1	0	0	0	0	0	0	0	0	0	0	3
AQ2019Q4	1	1	0	0	1	1	0	0	0	0	0	0	0	0	0	4
AQ2020Q1	0	3	4	1	0	0	0	0	0	0	0	0	0	0	0	8
AQ2020Q2	3	11	5	2	0	0	0	0	0	0	0	0	0	0	0	21
AQ2020Q3	0	2	2	0	0	1	0	0	0	0	0	0	0	0	0	5
AQ2020Q4	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	3
AQ2021Q1	3	3	0	1	0	0	0	0	0	0	0	0	0	0	0	7
AQ2021Q2	3	2	3	0	0	0	0	0	0	0	0	0	0	0	0	8
AQ2021Q3	4	3	0	0	0	0	0	0	0	0	0	0	0	0	0	7
AQ2021Q4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4
Sum	25	33	20	7	3	3	0	0	0	0	0	0	0	0	0	91

C. GAM Results

Table P presents the coefficients of the variables in the GAM. The table is organised in a specific manner, with variables that are common across states and/or periods appearing first, followed by variables that are unique to individual states (with more numerous data segments listed first), and lastly the dispersion parameter. The variables are presented in the same order as outlined in Section 4 (i.e., development period and accident period simplifications, calendar period effects, interactions between accident periods and development periods, and treatments of exceptional observations). Further, the table includes specific naming conventions that are used to identify the variables, which will be explained below.

The variables are identified by a unique name that comprises two components: a **data segment name** and a **definition**. The data segment name specifies the segment of data that the variable is applied to, which helps to differentiate it from other segments in the analysis. Naming conventions of data segments and variable definition are provided below.

Data segment names:

- 'IN1' refers to data breaches that affect between 0 and 249 Indiana residents. 'IN250' represents breaches that impact between 250 and 499 Indiana residents. 'IN500' pertains to breaches that affect more than 500 Indiana residents. And similarly for other states. The only exception is 'OR250', which refers to breaches that affect more than 250 Oregon residents.
- 'DE500_ND250' means the same variable applies to both data segments.

Definitions:

- The cross ($\times$) denotes the multiplication sign.
- 'i, j, c' represent accident quarters (AQ), development quarters (DQ), and calendar quarters (CQ).
- indicator functions
  - 'ind_j_2_5' $= 1_{\{2,5\}}(j)$ (as defined in Section 4.2.2). The first component 'ind' refers to 'indicator'. The second component 'j' represents a specific variable that the indicator variable is associated with. The remaining components '2' and '5' represent specific values that the indicator variable is associated with.
  - 'ind_i_ge_2020Q1' $= 1_{j \geq 2020Q1}(j)$
  - 'ind_j_le_4' $= 1_{[1,4]}(j)$
  - 'ind_c_2017Q4_2018Q1_opposite' $= -1_{2017Q4}(c) + 1_{2018Q1}(c)$
- 'max_0_and_j_minus_6' $= \max(0, j-6)$
- 'min_j_6' $= \min(j, 6)$
- 'i^2' $= i^2$
- 'IN500_ND500_ind_i_ge_2020Q1_ND500_ind_i_2020Q1' $= 1_{\text{IN500, ND500}} \cdot 1_{i \geq 2020Q1}(i) + 1_{\text{ND500}} \cdot 1_{2020Q1}(i)$

Table P: GAM Results (mean)

Dependent variable: ln(quarterly # of breaches)	
Variable name	Estimate
OR250_IN250_MT250 × ind_j_1_2_5 [1]	-1.5801
IN1_MT1 × ind_j_2_5 [2]	0.3977
DE500_ND250 × ind_j_2_5 [3]	0.9916
ND500_ME250 × ind_j_2_5 [4]	0.8573
IN500_MT500_ME500_WA500_OR250_IN250_MT250 × ind_j_2_5 [5]	1.2733
IN500_IN250 × ind_j_5 [6]	0.4684
ND500_WA500_MT250_ME250 × ind_j_5 [7]	0.9916
IN500_MT500_ME500_ND500_WA_500_OR250_IN250_MT250_ME250_ND250 × j [8]	-0.6955
IN500_MT500_ND500_WA_500_OR250_IN250_ME250_ND250 × max_0_and_j_minus_6 [9]	0.4698
IN1_ME1 × max_0_and_j_minus_6 [10]	-0.1834
WA500_OR250 × ind_i_ge_2020Q1 [11]	0.4992
MT250_ME250 × ind_i_ge_2020Q1 [12]	-0.5183
IN500_ND500_ind_i_ge_2020Q1_ND500_ind_i_2020Q1 [13]	1.0772
WA500_ind_c_2017Q2_WA500_OR250_ind_c_2018Q4 [14]	0.5478
IN1 × ind_c_2017Q4_2018Q1_opposite [15]	0.2710
ME1 × ind_c_2018Q2_2018Q3_opposite [16]	-0.2371
ME1 × ind_c_2018Q4_2019Q1_opposite [17]	0.3425
MT1_ME1 × ind_j_2 × max_0_and_i_minus_2017Q4 [18]	0.0776
CA500 × ind_i_2015Q3_2015Q4 [19]	-0.4870
IN1 × ind_i_2015Q2_2016Q2 [20]	0.3814
IN1 × ind_i_2016Q4_2019Q4 [21]	-0.2463
ME1 × ind_i_2014Q4_2016Q1_2016Q2_2017Q1_2017Q2_2017Q3 [22]	0.4804
IN500_ind_j_5_ind_i_2016Q1_IN500_WA500_OR250_ind_j_5_ind_i_2016Q3_IN500_ind_j_5_ind_i_2017Q4 [23]	1.6916
IN1_MT1_ME1 × ind_j_5 × ind_i_2016Q3 [24]	2.7835
CA500 × ind_j_1	-1.4722
CA500 × log_j_plus_1	-3.1905
CA500 × log_j_plus_1 × ind_j_le_4	-0.6144
CA500 × intercept	5.7693
CA500 × i	0.0973
CA500 × iˆ2	-0.0021
CA500 × ind_i_ge_2020Q1	0.7959
CA500 × max_0_and_i_minus_2020Q2	0.0998
CA500 × ind_c_2016Q1	0.3363
CA500 × ind_c_2020Q3	0.1137
CA500 × log_j_plus_1 × ind_j_le_4 × max_0_and_2014Q3_minus_i	0.0549
CA500 × log_j_plus_1 × ind_j_le_4 × j × max_0_and_i_minus_2014Q3	0.0135
CA500 × log_j_plus_1 × ind_j_le_4 × j × max_0_and_i_minus_2017Q1	-0.0097
CA500 × ind_j_1 × max_0_and_i_minus_2017Q1	-0.0506
CA500 × ind_i_2014Q2	0.5007
CA500 × ind_i_2017Q1	0.2439
CA500 × ind_i_2021Q2	-0.4501
CA500 × ind_i_2015Q4 × ind_j_4	1.9590
CA500 × ind_i_2016Q3 × ind_j_5	2.1228
IN1 × ind_j_1_2_5	0.3970
IN1 × ind_j_5	-0.6106
IN1 × min_j_6	-0.7152
IN1 × intercept	5.1813
IN1 × i	-0.0723
IN1 × iˆ2	-0.0062
IN1 × max_0_and_i_minus_2014Q3	0.3493
IN1 × ind_i_ge_2020Q1	0.0647
IN1 × max_0_and_i_minus_2020Q2	0.2631

Table P continued from previous page

IN1 × ind_c_2014Q4	0.3824
IN1 × ind_c_2016Q3	-0.2559
IN1 × ind_c_2019Q4	-0.4727
IN1 × ind_c_2020Q4	0.2187
IN1 × ind_j_2 × ind_i_ge_2017Q4	0.3812
IN1 × ind_j_3 × ind_i_ge_2017Q4	0.9300
IN1 × ind_j_4 × ind_i_ge_2017Q4	0.7946
IN1 × ind_j_3 × max_0_and_i_minus_2017Q4	0.0249
IN1 × j × max_0_and_i_minus_2017Q4	0.0406
IN1 × max_0_and_j_minus_6 × max_0_and_i_minus_2017Q4	-0.1309
IN1 × ind_i_2015Q3	-0.1265
IN1 × ind_i_2016Q1	0.6578
IN1 × ind_i_2017Q1	0.7881
IN1 × ind_i_2017Q4	-0.4923
IN1 × ind_i_2018Q1	0.1317
IN1 × ind_i_2019Q1	0.1186
IN1 × ind_i_2020Q2	0.4118
IN1 × ind_i_2016Q1 × ind_j_5	0.7900
MT1 × ind_j_1_2_5	1.0518
MT1 × ind_j_5	-1.5313
MT1 × min_j_6	-0.2827
MT1 × max_0_and_j_minus_6	-0.3223
MT1 × intercept	0.7279
MT1 × i	0.1443
MT1 × iˆ2	-0.0029
MT1 × ind_i_ge_2020Q1	0.4705
MT1 × ind_c_2019Q2	0.1885
MT1 × ind_c_2020Q3	-0.3137
MT1 × ind_j_3 × ind_i_ge_2017Q4	1.3183
MT1 × ind_j_4 × ind_i_ge_2017Q4	0.8188
MT1 × ind_j_5 × ind_i_ge_2017Q4	1.0009
MT1 × j × ind_i_ge_2017Q4	-0.0430
MT1 × ind_j_3 × max_0_and_i_minus_2017Q4	0.0731
MT1 × ind_j_4 × max_0_and_i_minus_2017Q4	0.0740
MT1 × ind_i_2016Q1	0.4164
MT1 × ind_i_2017Q1	0.4236
MT1 × ind_i_2016Q1 × ind_j_5	1.5657
MT1 × ind_i_2017Q4 × ind_j_1	-1.0562
MT1 × ind_i_2018Q3 × ind_j_5	0.6761
ME1 × ind_j_1_2_5	0.6670
ME1 × ind_j_2_5	0.1475
ME1 × ind_j_5	-0.6840
ME1 × min_j_6	-0.5989
ME1 × intercept	3.2773
ME1 × i	0.0066
ME1 × iˆ2	-0.0052
ME1 × max_0_and_i_minus_2014Q3	0.2252
ME1 × ind_i_ge_2020Q1	0.6260
ME1 × ind_j_1 × ind_i_ge_2017Q4	-0.4621
ME1 × ind_j_3 × ind_i_ge_2017Q4	0.3832
ME1 × ind_j_4 × ind_i_ge_2017Q4	0.4309
ME1 × ind_j_5 × ind_i_ge_2017Q4	0.0120
ME1 × j × ind_i_ge_2017Q4	0.1761
ME1 × ind_j_3 × max_0_and_i_minus_2017Q4	0.1666
ME1 × ind_j_4 × max_0_and_i_minus_2017Q4	0.1186
ME1 × ind_j_5 × max_0_and_i_minus_2017Q4	0.0652

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ME1 × max_0_and_j_minus_6 × max_0_and_i_minus_2017Q3	-0.2091
ME1 × ind_i_7	-0.4358
ME1 × ind_i_2016Q3 × ind_j_4	1.7082
ME1 × ind_i_2016Q1 × ind_j_5	1.0922
WA500 × ind_j_1_2_5	-1.6858
WA500 × intercept	2.5211
WA500 × i	-0.0005
WA500 × iˆ2	0.0007
WA500 × ind_c_2020Q3	0.5364
WA500 × ind_i_2018Q1 × ind_j_5	1.0258
OR250 × ind_j_5	0.6630
OR250 × intercept	2.0431
OR250 × i	0.0948
OR250 × iˆ2	-0.0014
OR250 × ind_c_2020Q2	-0.6967
OR250 × ind_i_2021Q1	0.5014
IN500 × ind_j_1_2_5	-1.4422
IN500 × intercept	0.4537
IN500 × i	0.2020
IN500 × iˆ2	-0.0039
MT500 × ind_j_1_2_5	-1.8504
MT500 × ind_j_5	1.1829
MT500 × intercept	2.9185
MT500 × i	-0.1035
MT500 × iˆ2	0.0028
ME500 × ind_j_1_2_5	-1.0389
ME500 × max_0_and_j_minus_6	0.1783
ME500 × intercept	0.2687
ME500 × i	0.0755
ME500 × iˆ2	-0.0009
ND500 × ind_j_1_2_5	-1.9707
ND500 × intercept	22.9320
ND500 × i	-1.2103
ND500 × iˆ2	0.0175
DE500 × ind_j_1_2_5	-1.2181
DE500 × j	-0.6253
DE500 × max_0_and_j_minus_6	-12.2351
DE500 × intercept	9.9864
DE500 × i	-0.5750
DE500 × iˆ2	0.0100
DE500 × ind_i_2020Q2	1.3953
IN250 × intercept	1.4660
IN250 × i	0.0465
IN250 × iˆ2	-0.0006
IN250 × ind_i_ge_2020Q1	0.6695
IN250 × ind_i_2020Q1	0.6447
MT250 × max_0_and_j_minus_6	0.4992
MT250 × intercept	5.4824
MT250 × i	-0.3349
MT250 × iˆ2	0.0067
ME250 × ind_j_1_2_5	-1.3984
ME250 × intercept	1.8328
ME250 × i	-0.0905
ME250 × iˆ2	0.0025
ND250 × ind_j_1_2_5	-2.3052
ND250 × ind_j_5	1.3371

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ND250 × intercept	50.9165
ND250 × i	-2.7139
ND250 × i^2	0.0359
ND250 × ind_i_ge_2020Q1	2.2145
Dispersion parameter	1.3250

Note 1: See the text above this table for variable definitions.
Note 2: Periods assigned to have zero weight are OR250_WA500 × ind_i_2016Q1, CA500 × ind_i_2018Q2_2018Q3, CA500_IN1_MT1_WA500 × ind_i_2020Q1.

D. Model diagnostics

This section provides model diagnostics for the Quarterly Run-off Triangle of the number of data breaches that affect more than 500 California residents.

Table Q - S compare the actual and fitted sum of events by development quarters (DQ), accident quarters (AQ), and calendar quarters (CQ), where Z score = $\frac{\text{Actual}-\text{Fitted}}{\sqrt{\text{Fitted}}}$. Observations in AQ 2018Q2, 2019Q4, 2020Q1 are removed from Table Q and S as they have been assigned zero weight in the GAM.

Figure A visualises the pattern in Z score calculated from Table Q - S. Figure B plots the deviance residuals. These heatmaps reveal no patterns or clusters, which suggest that our modelling is adequate.

Similar heatmaps are found in all other data segments. In an attempt to reduce the number of pages in the document, they are not presented here and are available upon submission of the data and codes.

Table Q: Sum of events by development quarters

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
Actual Sum	500	714.00	294.00	161.00	123.00	48.00	35.00	21.00	9.00	14.00
Fitted Sum	500	714.79	285.37	167.89	117.73	54.28	33.13	21.39	15.16	11.13
Actual/Fitted	1	1.00	1.03	0.96	1.04	0.88	1.06	0.98	0.59	1.26
Z score	0	-0.03	0.51	-0.53	0.49	-0.85	0.33	-0.09	-1.58	0.86

Table R: Sum of events by accident quarters

	2012Q1	2012Q2	2012Q3	2012Q4	2013Q1	2013Q2	2013Q3	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	2016Q4	2017Q1	2017Q2	2017Q3	2017Q4	2018Q1	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1	2021Q2	2021Q3	2021Q4
Actual Sum	22.00	29.00	27.00	37.00	35.00	29.00	41.00	33.00	36.00	59	31.00	46.00	47.00	42.00	33.00	42.00	62.00	50.00	78.00	47.00	78	53.00	54.00	73.00	60.00	60.00	66.00	47.00	58.00	50.00	53.00	79.00	102.00	110.00	80.00	92.00	104.00	55	65.00	18.00
Fitted Sum	27.82	29.01	30.14	31.20	32.19	33.09	33.90	34.61	35.23	59	36.22	39.05	42.13	44.68	29.86	45.14	57.92	54.15	79.48	58.92	78	61.03	60.73	60.20	59.44	58.47	57.29	55.91	54.34	52.60	50.72	48.85	103.72	100.17	100.32	99.55	97.80	55	64.79	15.37
Actual/Fitted	0.79	1.00	0.90	1.19	1.09	0.88	1.21	0.95	1.02	1	0.86	1.18	1.12	0.94	1.11	0.93	1.07	1.03	0.98	0.80	1	0.87	0.89	1.21	1.01	1.03	1.15	0.84	1.07	0.95	1.04	1.62	0.98	1.10	0.80	0.92	1.06	1	1.00	1.17
Z score	-1.10	0.00	-0.57	1.04	0.50	-0.71	1.22	-0.27	0.13	0	-0.87	1.11	0.75	-0.40	0.58	-0.47	0.54	0.25	-0.17	-1.55	0	-1.03	-0.86	1.65	0.07	0.20	1.15	-1.19	0.50	-0.36	0.32	4.31	-0.17	1.88	-2.03	-0.76	0.63	0	0.03	0.67

Table S: Sum of events by calendar quarters

	2012Q1	2012Q2	2012Q3	2012Q4	2013Q1	2013Q2	2013Q3	2013Q4	2014Q1	2014Q2	2014Q3	2014Q4	2015Q1	2015Q2	2015Q3	2015Q4	2016Q1	2016Q2	2016Q3	2016Q4	2017Q1	2017Q2	2017Q3	2017Q4	2018Q1	2018Q2	2018Q3	2018Q4	2019Q1	2019Q2	2019Q3	2019Q4	2020Q1	2020Q2	2020Q3	2020Q4	2021Q1	2021Q2	2021Q3	2021Q4
Actual Sum	7.00	19.00	27.00	29.00	27.00	24.00	31.00	40.00	25.00	37.00	37.00	35.00	31.00	48.00	41.00	31.00	54	43.00	63.00	51.00	60.00	68.00	75.00	65.00	54.00	50.00	36.00	55.00	47.00	59.00	45.00	45.00	24.00	34.00	71	73.00	92.00	105.00	93.00	106.00
Fitted Sum	8.46	18.78	23.39	26.01	27.85	29.26	30.39	31.32	32.08	40.30	40.43	36.59	37.08	39.84	36.30	32.73	54	45.90	60.66	52.41	60.28	62.64	83.43	59.97	59.36	45.13	37.48	47.90	50.58	51.94	51.89	42.42	23.54	30.80	71	81.18	94.81	97.66	93.29	107.92
Actual/Fitted	0.83	1.01	1.15	1.11	0.97	0.82	1.02	1.28	0.78	0.92	0.92	0.96	0.84	1.20	1.13	0.95	1	0.94	1.04	0.97	1.00	1.09	0.90	1.08	0.91	1.11	0.96	1.15	0.93	1.14	0.87	1.06	1.02	1.10	1	0.90	0.97	1.08	1.00	0.98
Z score	-0.50	0.05	0.75	0.59	-0.16	-0.97	0.11	1.55	-1.25	-0.52	-0.54	-0.26	-1.00	1.29	0.78	-0.30	0	-0.43	0.30	-0.19	-0.04	0.68	-0.92	0.65	-0.70	0.72	-0.24	1.03	-0.50	0.98	-0.96	0.40	0.10	0.58	0	-0.91	-0.29	0.74	-0.03	-0.18

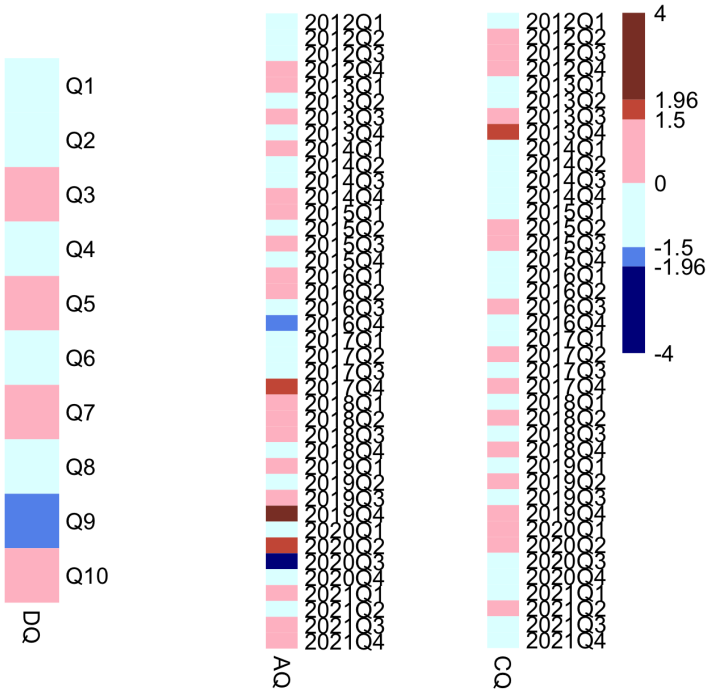

Figure A: Heatmaps of Z score by development quarters, accident quarters, and calendar quarters

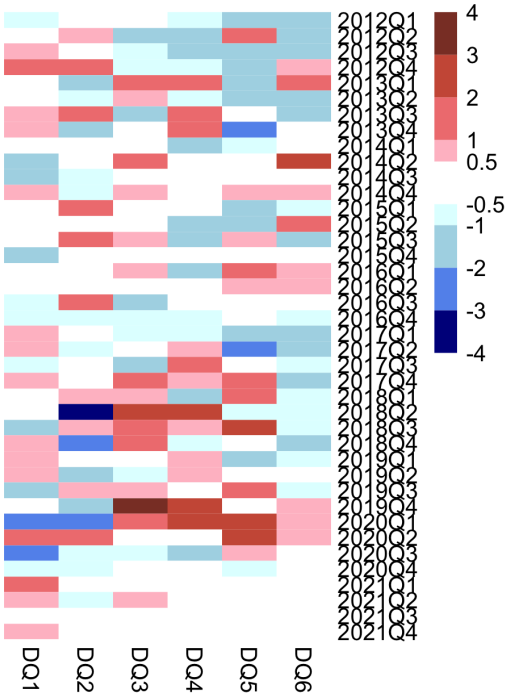

Figure B: Heatmap of deviance residuals

E. Frequency trend

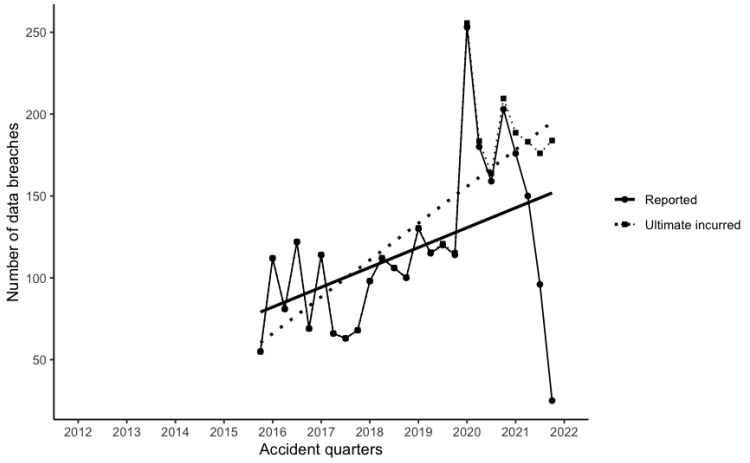

Figure C: Reported versus Ultimate incurred breaches (AQ 2015Q4 - 2021Q4, MT(0-249))

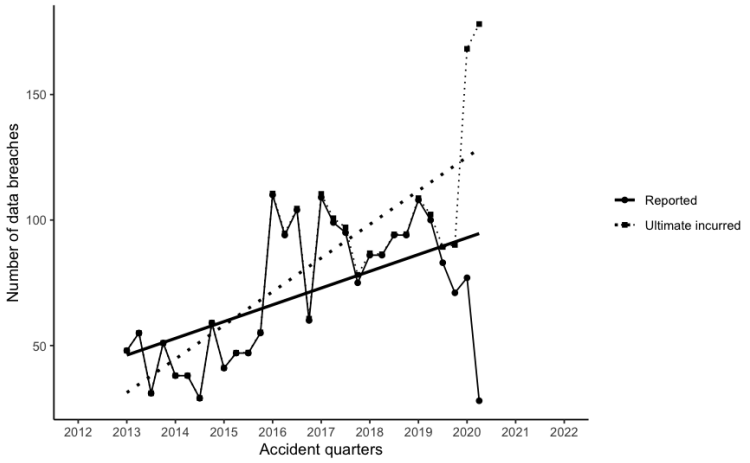

Figure D: Reported versus Ultimate incurred breaches (AQ 2013Q1 - 2020Q2, ME(0-249))

F. Interactions between development periods and accident periods

F.1. CA(>499)

Figures E - G show the trends in development pattern of breaches that affect more than 500 California residents between 2012Q1 and 2021Q4. On average, around 80% of breaches are disclosed within the first four quarters of occurrence, and 90% within six quarters. The change in development pattern manifests itself in the first four DQs. Fitted incremental and cumulative percentage of breaches reported in DQ 1-4 are plotted respectively, based on the total number of breaches including IBNRs.

There are two change-points: 2014Q3 and 2017Q1. From 2012Q1 to 2014Q3, the incremental percentage of breaches reported in DQ 1 becomes larger, and smaller in DQ 2-4 respectively. The cumulative percentage of breaches starting from DQ 2 becomes smaller, and the cumulative percentage of breaches reported within one year from occurrence decreases from 86% to 79%.

From 2014Q3 to 2017Q1, the changes are reversed. The incremental percentage of breaches reported in DQ 1 becomes smaller, and larger in DQ 2-4 respectively. However, while the cumulative percentage in DQ 1 and DQ 2 becomes lower, it becomes larger in DQ 3 and DQ 4. The cumulative percentage of breaches reported within one year from occurrence increases from 79% to 83%.

Although the period between 2017Q1 and 2021Q4 continues the same pattern of change as the period between 2014Q3 to 2017Q1, that is, the incremental percentage of breaches reported in DQ 1 becomes smaller, and larger in DQ 2-4 respectively, the magnitude of change is greater. The percentage of breaches reported in DQ 1 decreases from 28% to 12%. The cumulative percentage in all DQs before DQ 4 becomes lower, and finally in DQ 4, catches up to the level observed for breaches occurred in 2017Q1. The cumulative percentage of breaches reported within one year from occurrence keeps around 83%.

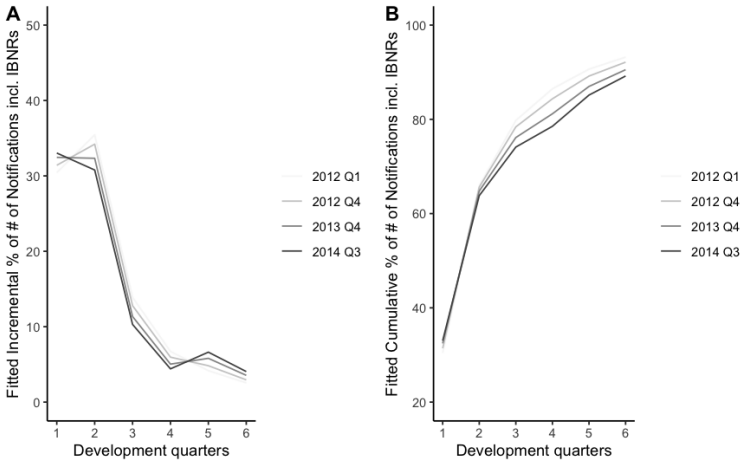

Figure E: Development pattern trend (AQ 2012Q1 - AQ 2014Q3, CA(>499))

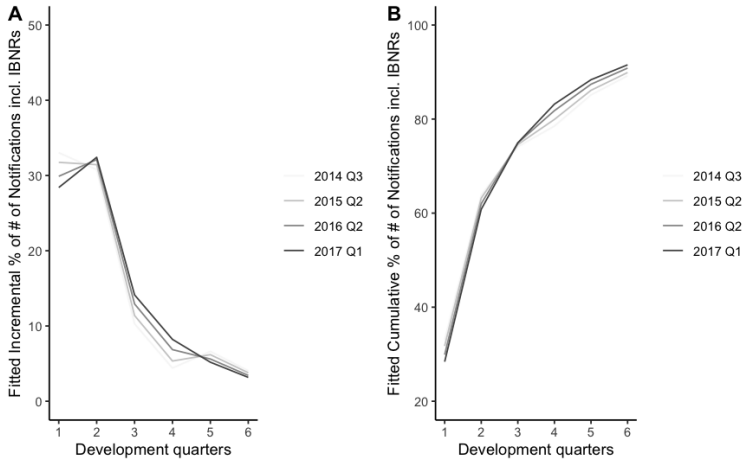

Figure F: Development pattern trend (AQ 2014Q3 - AQ 2017Q1, CA(>499))

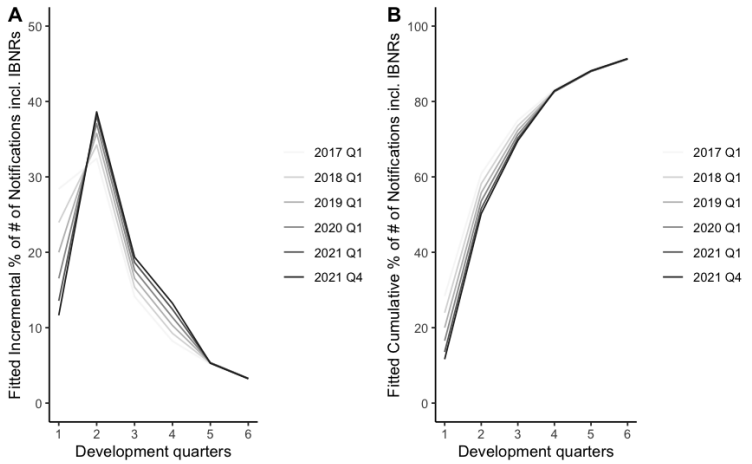

Figure G: Development pattern trend (AQ 2017Q1 - AQ 2021Q4, CA(>499))

F.2. IN(0-249)

Figure H shows the trend in development pattern of breaches that affect between 0 and 249 Indiana residents between 2014Q1 and 2021Q2. On average, around 90% of breaches are disclosed within four quarters of occurrence, and almost all breaches are reported within six quarters. The change in development pattern is observed in the first six DQs. Fitted incremental and cumulative percentage of breaches reported in DQ 1-6 are plotted respectively, based on the total number of breaches including IBNRs.

In the period between 2014Q1 and 2017Q3, data breaches are subject to a constant development pattern and 2017Q4 is the point of change. From 2017Q4 onward, the incremental percentage of breaches reported in DQ 1 and DQ 2 becomes smaller, and larger in all subsequent DQs. The cumulative percentage in all DQs before DQ 6 is consistently lower than before, until which it catches up to the level observed for breaches occurred in 2017Q3. Cumulative percentage of breaches reported within one year from occurrence decreases from 93% to 87%, and cumulative percentage within six quarters increases from 96% to 98%, when comparing 2017Q3 and 2021Q2.

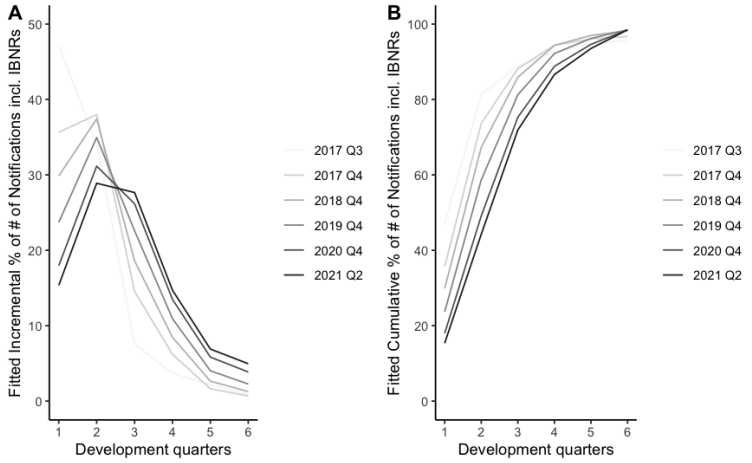

Figure H: Development pattern trend (AQ 2014Q1 - AQ 2021Q2, IN (0-249))

F.3. MT(0-249)

Figure I shows the trend in development pattern of breaches that affect between 0 and 249 Montana residents between 2015Q4 and 2021Q4. On average, around 90% of breaches are disclosed within four quarters of occurrence, and almost all breaches are reported within six quarters. The change in development pattern is observed in the first six DQs. Fitted incremental and cumulative percentage of breaches reported in DQ 1-6 are plotted respectively, based on the total number of breaches including IBNRs.

In the period between 2015Q4 and 2017Q3, data breaches are subject to a constant development pattern and 2017Q4 is the point of change. From 2017Q4 onward, the incremental percentage of breaches reported in DQ 1 becomes smaller, larger in all DQs between DQ 2 and DQ 4, and smaller in DQ 5 and DQ 6. The cumulative percentage is lower in the first two DQs, but higher in all later DQs. Cumulative percentage of breaches reported within one year from occurrence increases from 86% to 94%, and cumulative percentage within six quarters increases from 92% to 98%, when comparing 2015Q4 and 2021Q2.

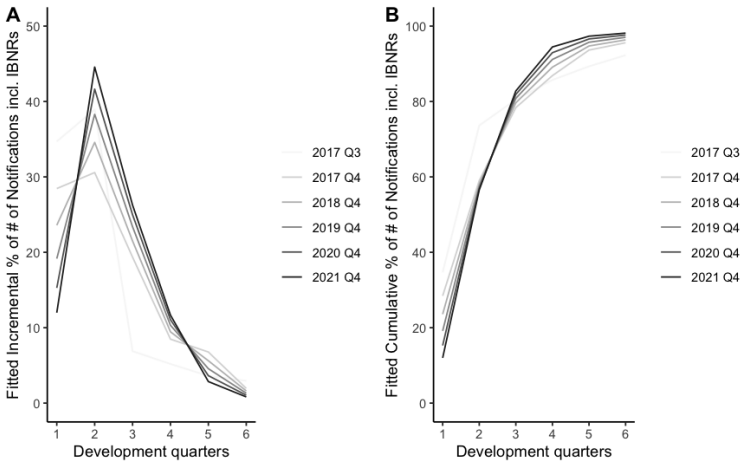

Figure I: Development pattern trend (AQ 2015Q4 - AQ 2021Q4, MT (0-249))

F.4. ME(0-249)

Figures J and K show the trends in development pattern of breaches that affect between 0 and 249 Maine residents between 2013Q1 and 2020Q2. On average, around 90% of breaches are disclosed within four quarters of occurrence, and almost all breaches are reported within six quarters. The change in development pattern is observed in the first six DQs. Fitted incremental and cumulative percentage of breaches reported in DQ 1-6 are plotted respectively, based on the total number of breaches including IBNRs.

In the period between 2013Q1 and 2017Q3, data breaches are subject to a constant development pattern. Data breaches occurred in 2017Q4 are more delayed: the cumulative percentage at all DQs is lower. Then, between 2018Q1 and 2018Q4, the delay is shortening. The cumulative percentage at DQ 1 and DQ 2 is indistinguishable from that of breaches occurred in 2018Q1, but the cumulative percentage at all subsequent DQs is higher.

From 2018Q4 onward, the incremental percentage of breaches reported in DQ 1 and DQ 2 becomes smaller, larger in DQ 3 and DQ 4, and smaller in DQ 5 and DQ 6. The cumulative percentage is lower in the first two DQs, but higher in all later DQs. Cumulative percentage of breaches reported within one year from occurrence increases from 90% to 94%, and cumulative percentage within six quarters increases from 94% to 100%, when comparing 2013Q1 and 2020Q2.

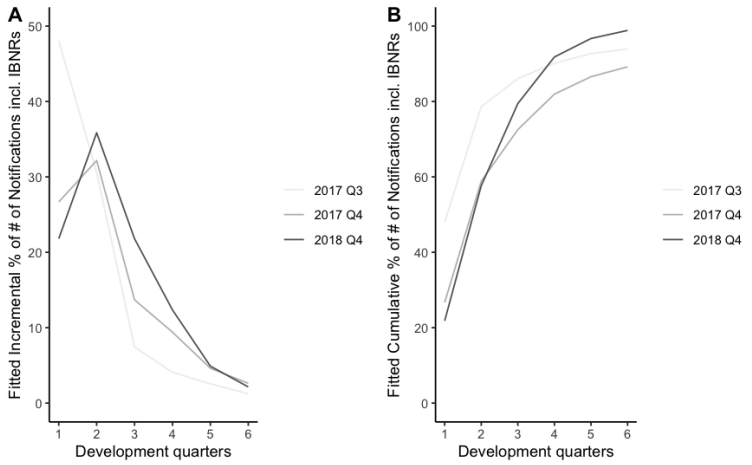

Figure J: Development pattern trend (AQ 2013Q1 - AQ 2018Q4, ME (0-249))

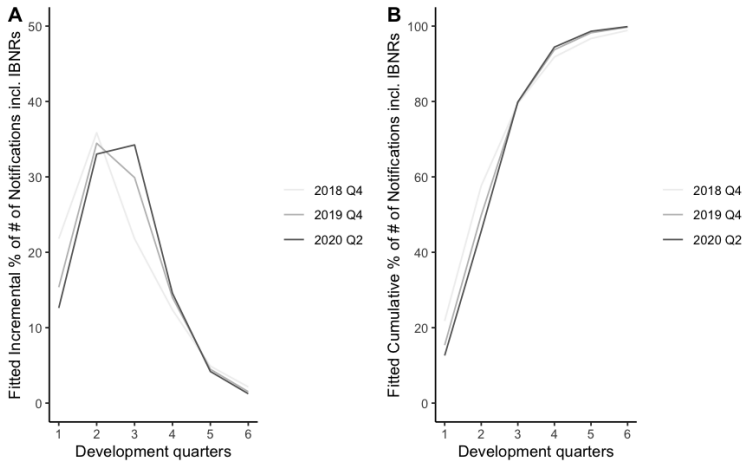

Figure K: Development pattern trend (AQ 2018Q4 - AQ 2020Q2, ME (0-249))

G. Average reporting delay

G.1. MT(0-249)

Shown in Figure L, the average time to report data breaches is 2.64 quarters between 2013Q1 and 2017Q3, increases to 2.68 quarters in 2017Q4, and gradually decreases to the same level as before. The average reporting delay is fairly constant over time.

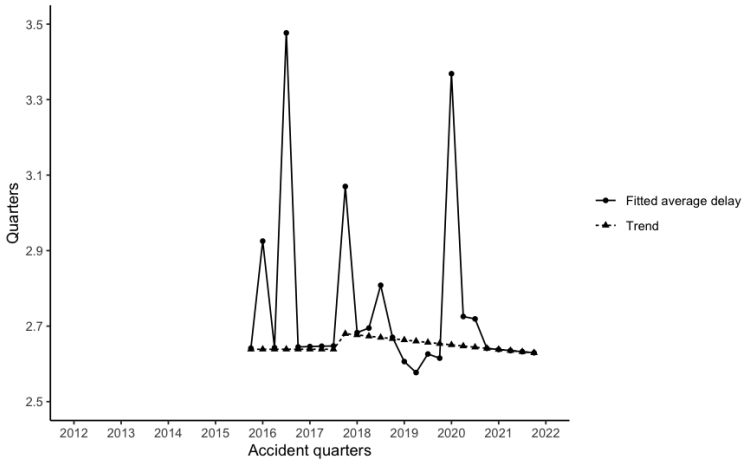

Figure L: Fitted average delay and its trend - MT(0-249)

G.2. ME(0-249)

Shown in Figure M, the average time to report data breaches is 2.39 quarters between 2015Q4 and 2017Q3, increases to 2.7 quarters in 2018Q1, decreases at a decreasing rate until 2018Q4 to 2.54 quarters, and increases slightly to 2.69 quarters in 2020Q2.

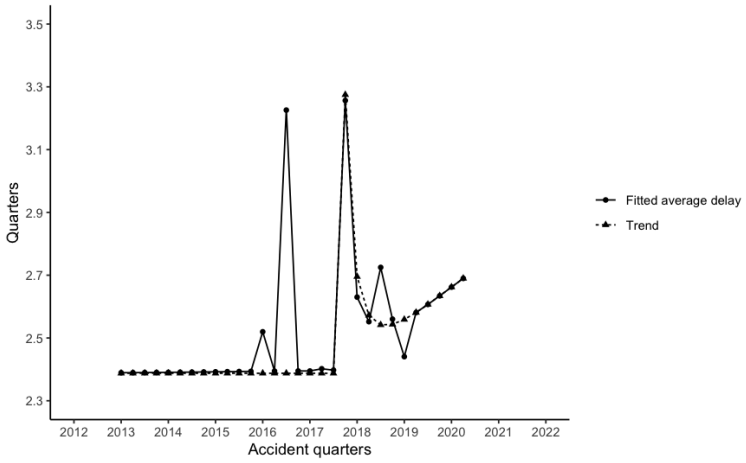

Figure M: Fitted average delay and its trend - ME(0-249)