

ORIGINAL RESEARCH ARTICLE

Signatures of neurological adverse events after vaccination

Supplementary File

Table S1. Day 0 adverse events frequencies per 100,000 vaccinations with symptoms

Adverse events	COVID-19	DTAP	DTP	FLU3	HEP	HIBV	HPV4	IPV	MENB	MMR	PNC	PNC13	VARCEL
Abnormal behavior	10	265	102	74	109	338	81	200	188	295	343	357	107
Aphasia	83	83	41	58	36	118	57	43	43	180	63	101	39
Autism spectrum disorder	179	153	94	7	74	225	4	112	22	431	161	103	67
Febrile convulsion	110	512	<b>1,065</b>	148	201	951	4	580	<b>1,909</b>	396	890	808	197
Seizure	351	<b>1,513</b>	<b>4,785</b>	515	<b>1,375</b>	<b>2,805</b>	<b>1,646</b>	<b>1,721</b>	<b>1,822</b>	<b>1,248</b>	<b>2,205</b>	<b>1,459</b>	560
Speech disorder	90	128	168	127	150	140	108	110	123	230	105	96	57
Staring	9	351	66	69	136	380	98	375	181	161	719	439	87
Tinnitus	434	19	12	149	115	0	221	18	202	52	0	26	28
Syncope	<b>2,037</b>	<b>1,007</b>	<b>1,188</b>	<b>1,802</b>	<b>2,171</b>	673	<b>9,324</b>	<b>1,728</b>	<b>5,545</b>	<b>1,684</b>	939	911	<b>1,422</b>

Notes: Based on VAERS data from 1990 to November 3, 2023. Frequency values over 1,000 are in bold. VAERS vaccine codes: COVID-19: Coronavirus Disease 2019; DTAP: Diphtheria and tetanus toxoids and acellular pertussis; DTP: Diphtheria and tetanus toxoids and pertussis; FLU3: Influenza, trivalent; HEP: Hepatitis B; HIBV: Haemophilus influenzae B conjugate; HPV4: Human papillomavirus; quadrivalent; IPV: Poliovirus, inactivated; MENB: Meningococcal group B, rDNA absorbed; MMR: Measles, mumps, and rubella, live; PNC: Pneumococcal 7-valent conjugate; PNC13: Pneumococcal 13-valent conjugate; VARCEL: Varivax-Varicella.

Table S2. COVID-19 neurological adverse events by age per 100,000 vaccinations with symptoms

Adverse events	Age									
	0 – 10	11 – 20	21 – 30	31 – 40	41 – 50	51 – 60	61 – 70	71 – 80	81 – 90	91 – 100
VAERS shots	18,650	69,172	122,211	174,688	175,212	181,442	171,291	115,922	46,316	9,675
Abnormal behavior	166	61	32	21	22	25	53	72	136	165
Aphasia	32	163	191	232	297	317	271	369	548	651
Cognitive disorder	5	46	101	140	166	163	145	178	268	403
Coordination abnormal	11	14	61	63	87	58	55	72	65	62
Delirium	48	42	88	69	58	71	85	145	324	579
Depression	16	95	208	271	275	270	206	176	127	103
Encephalopathy	11	35	19	23	23	47	102	178	363	331
Mental impairment	5	42	110	102	123	118	87	91	125	145
Mental status changes	59	59	32	41	56	103	283	551	<b>1,216</b>	<b>1,344</b>
Metabolic encephalopathy	0	0	2	3	6	19	50	123	276	424
Nervous system disorder	11	65	70	102	106	99	79	75	54	72
Seizure	<b>1,115</b>	<b>2,115</b>	<b>1,541</b>	878	667	508	398	440	503	506
Speech disorder	64	175	225	245	298	269	276	305	458	434

Notes: Based on VAERS data from 1990 to November 3, 2023. Frequency values over 1,000 are in bold.

**Table S3. FLU3 neurological adverse events by age per 100,000 vaccinations with symptoms**

Adverse events	Age									
	0 – 9	10 – 19	20 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	90 – 99
VAERS shots	11,657	4,656	6,735	9,145	11,377	12,838	17,444	11,569	3,898	518
Abnormal behavior	669	279	89	11	44	39	40	130	180	386
Aphasia	275	129	119	109	132	140	115	147	231	579
Cognitive disorder	86	86	59	44	88	62	34	17	51	193
Coordination abnormal	146	107	148	164	378	249	149	242	257	193
Delirium	103	64	59	66	62	55	109	173	103	0
Depression	17	129	89	120	158	101	115	121	128	0
Encephalopathy	146	43	45	33	44	39	57	78	51	193
Mental impairment	17	64	45	22	62	78	57	69	51	0
Mental status changes	129	64	59	33	18	78	34	95	308	0
Metabolic encephalopathy	0	0	0	0	9	0	6	0	0	0
Nervous system disorder	103	150	45	109	105	93	80	52	51	0
Seizure	<b>4,684</b>	<b>3,200</b>	<b>1,321</b>	678	369	351	321	346	513	772
Speech disorder	257	344	193	241	316	288	235	320	539	965

Notes: Based on VAERS data from 1990 to November 3, 2023. Frequency values over 1,000 are in bold.

**Table S4. Autism spectrum disorder reports per 100,000 VAERS symptom reports for each vaccine type**

Year	Vaccine name						
	MMR	HIBV	DTAP	HEP	VARCEL	IPV	PNC
1990	444						
1991	<48	71					
1992	194	63					
1993	57	36					
1994	559	<43					
1995	201	108	254	34			
1996	412	434	377	69			
1997	756	343	172	<34		<275	
1998	939	73	<57	36	104	<156	
1999	<b>1,674</b>	736	164	333	38	91	
2000	<b>3,816</b>	<b>1,673</b>	599	386	415	225	
2001	<b>6,972</b>	<b>2,933</b>	676	<b>1,162</b>	517	326	71
2002	<b>7,996</b>	<b>4,279</b>	<b>1,424</b>	<b>3,229</b>	<b>1,053</b>	870	409
2003	<b>4,873</b>	<b>2,222</b>	636	<b>2,257</b>	772	359	481
2004	<b>1,443</b>	<b>1,583</b>	764	<b>1,660</b>	552	708	614
2005	<b>1,292</b>	<b>1,952</b>	788	<b>1,639</b>	543	623	<b>1,827</b>
2006	<b>1,523</b>	<b>1,921</b>	909	<b>2,855</b>	343	438	617
2007	<b>3,102</b>	<b>1,386</b>	607	<b>1,557</b>	235	260	352
2008	<b>1,442</b>	<b>1,191</b>	807	757	289	627	790
2009	<b>4,252</b>	<b>1,744</b>	500	<b>1,240</b>	324	511	598
2010	<b>1,287</b>	<b>1,534</b>	915	987	174	<b>1,577</b>	945
2011	908	447	346	515	199	195	707
2012	<b>1,041</b>	525	411	104	131	352	<b>1,423</b>
2013	893	334	320	479	107	202	<b>1,275</b>
2014	<b>1,265</b>	317	790	481	305	384	<b>3,315</b>
2015	<b>1,338</b>	437	637	219	210	317	870
2016	<b>1,438</b>	304	926	236	243	<b>1,084</b>	<b>3,670</b>
2017	<b>2,438</b>	798	<b>1,753</b>	468	407	960	<b>5,056</b>
2018	994	436	591	262	213	608	<b>1,961</b>
2019	<b>1,660</b>	739	<b>1,838</b>	644	574	841	<b>1,087</b>
2020	<b>1,494</b>	400	959	584	159	135	877
2021	<b>1,534</b>	242	751	408	163	528	<b>1,515</b>
2022	925	273	465	50	54	<160	787
2023	867	81	564	53	239	132	<2439

Notes: Frequency values over 1,000 are in bold. VAERS vaccine codes: DTAP: Diphtheria and tetanus toxoids and acellular pertussis; HIBV: *Haemophilus influenzae* B conjugate; IPV: Poliovirus, inactivated; MMR: Measles, mumps, and rubella, live; PNC: Pneumococcal 7-valent conjugate; VARCEL: Varivax-Varicella.