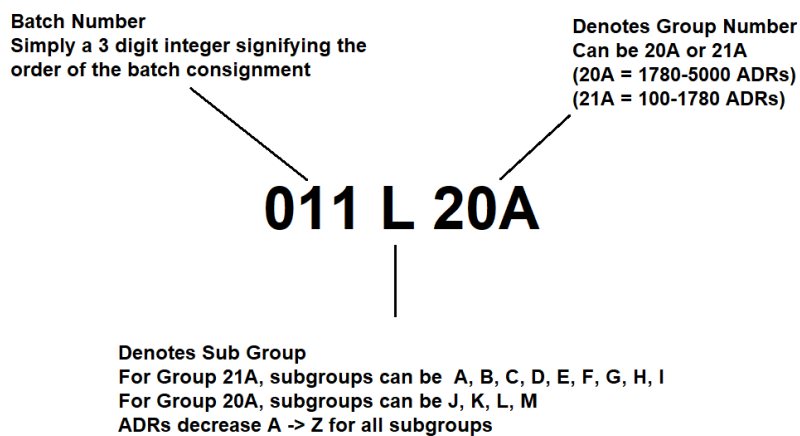# Moderna Vaccine Batches and Toxicity – a full analysis

By Craig Paardekooper

Wide Variation in Toxicity Between Batches

Moderna deployed batches with varying toxicity. Some batches generate only 1 or 2 adverse reaction reports, whilst others generate up to 5000 adverse reaction reports.

Interpreting a Moderna Batch Code

Batch Number
Simply a 3 digit integer signifying the
order of the batch consignment

Denotes Group Number
Can be 20A or 21A
(20A = 1780-5000 ADRs)
(21A = 100-1780 ADRs)

011 L 20A

Denotes Sub Group
For Group 21A, subgroups can be A, B, C, D, E, F, G, H, I
For Group 20A, subgroups can be J, K, L, M
ADRs decrease A -> Z for all subgroups

Two Main Groups of Batches – 20A and 21A

	Batch	Count	
	039k20a	4985	
	026L20A	4250	
	011J20A	3800	
	013L20A	3233	
	025L20A	3186	
	012L20A	3116	
	unknown	2823	
	029L20A	2817	
	011L20A	2774	
	041L20A	2742	
	028L20A	2673	
	037K20A	2669	
	030L20A	2640	
	007M20A	2440	
	012M20A	2383	
	013M20A	2374	
	042L20A	2357	
	010m20a	2219	
	031L20A	2199	
	025J20-2A	1989	
	032L20A	1989	
	027L20A	1931	
	024M20A	1878	
	030M20A	1783	
	004M20A	1780	
	016M20A	1780	
	044a21a	1767	
	027A21A	1731	
	015M20A	1723	
	023M20A	1696	
	011A21A	1657	
	036A21A	1649	
	040A21A	1648	
	025J20A	1647	
	011M20A	1643	
	018B21A	1643	
	031M20A	1641	
	010A21A	1624	
	013a21a	1546	
	030A21A	1539	
	046a21a	1532	
	014m20a	1512	
	026a21a	1491	
	022M20A	1488	

A) 20A is most toxic

The 30 batches generating the most adverse reactions are shown below. It can be seen that all of these end with the letters 20A. All of the batches generating in excess of 1780 adverse reaction reports have batch codes ending in 20A

B) 21A is

Batches generating fewer than 1780 adverse reaction reports have batch codes mostly ending in 21A. Batches ending 20A are very infrequent at this lower level of toxicity

The top 26 most toxic batches all belong to the 20A group

Sub Groups Within 20A

The sub groups within the 20A group are labelled J, K, L or M

These are in descending order of toxicity.

Sub Groups Within 21A

The sub groups within the 21A group are labelled A, B, C, D, E, F

These groups are in descending order of toxicity.

As you will see, subgroups denote different levels of toxicity. These follow a general trend of decreasing toxicity as the alphabet is ascended

J > K > L > M

A > B > C > D > E > F

Number of Batches Within each Sub Group

This is a 3 digit number at beginning of the batch code. It simply tells you the number of the batch - it does not tell you anything about toxicity.

Batches are normally numbered in sequence, i.e. they are normally accompanied by batches with adjacent numbers. The batch numbers do not always start at 1.

The number of batches in each subgroup can vary.

Batch numbers are unique within each subgroup – there is only one instance of each number.

Some batches within each group will likely be placebo – generating only 1 or 2 adverse reaction reports, whilst others will be in the experimental group and generate high numbers of adverse reactions.

We will now proceed to determine the toxicity level of each subgroup.

Sub Groups Adverse Reaction Levels

J, K, L, M | A, B, C, D, E, F

Sub Group	Batch Code	Adverse Reactions	Average Adverse Reactions per Batch
J	011J20A	3800	
	025J20-2A / 025J20A	1989 + 1647	3718
K	039k20a / 039k20-2a	4985 + 422	
	037K20A	2669	
	038K20A	899	
	029k20a	723	2424
L	026L20A	4250	
	013L20A	3233	
	025L20A	3186	
	012L20A	3116	
	029L20A	2817	
	011L20A	2774	
	041L20A	2742	
	028L20A	2673	
	030L20A	2640	
	042L20A	2357	
	031L20A	2199	
	032L20A	1989	
	027L20A	1931	
	043L20A	980	2634
M	007M20A	2440	
	012M20A	2383	
	013M20A	2374	
	010m20a	2219	
	024M20A	1878	
	030M20A	1783	
	016M20A	1780	
	004M20A	1780	
	015M20A	1723	

	023M20A	1696	
	011M20A	1643	
	031M20A	1641	
	014m20a	1512	
	022M20A	1488	
	032M20A	1131	
	006M20A	1130	1787
A	044a21a	1767	
	027A21A	1731	
	011A21A	1657	
	036A21A	1649	
	040A21A	1648	
	010A21A	1624	
	013a21a	1546	
	030A21A	1539	
	046a21a	1532	
	026a21a	1491	
	002A21A	1398	
	012A21A	1397	
	031a21a	1379	
	038A21A	1362	
	025A21A	1347	
	001A21A	1310	
	029A21A	1237	
	045A21A	1214	
	047A21A	1208	
	028A21A	1206	
	048a21a	1122	
	003A21A	1087	
	037A21B	1058	1413
B	018B21A	1643	
	007b21a	1427	
	006b21a	1397	
	003B21A	1327	
	017B21A	1281	
	001B21A	1276	
	016B21A	1181	

	002B21A	1098	
	021B21A	1096	
	027B21A	1061	
	031B21A	1056	
	019B21A	1035	
	020B21A	1034	
	026B21A	1028	
	025B21A	1024	
	040B21A	1023	
	037B21A	1002	
	038B21A	970	
	046B21A	960	
	036B21A	940	
	047B21A	939	
	043B21A	933	
	030B21A	927	
	032B21A	889	
	039B21A	866	
	041B21A	812	
	044B21A	793	
	048B21A	733	
	008B21A	722	
	045B21A	717	
	042B21A	618	
	033B21A	530	
	022B21A	457	992
C	007C21A	1022	
	002c21a	1019	
	006c21a	895	
	001C21A	824	
	003C21A	800	
	009C21A	781	
	017c21a	764	
	008C21A	754	
	037C21A	744	
	035C21A	721	
	004c21a	708	
	016C21A	669	

	023C21A	630	
	021C21A	624	
	005C21A	624	
	027c21a	618	
	022C21A	602	
	014C21A	582	
	041C21A	572	
	025C21A	568	
	076C21A	566	
	034C21A	556	
	033C21A	549	
	040c21A	507	
	050C21A	498	
	036C21A	495	
	026c21a	478	
	024C21A	466	
	047C21A	459	
	038C21A	453	
	054C21A	444	
	048C21A	420	
	049C21A	406	
	051C21A	321	
	046C21A	293	
	053C21A	248	
	078c21a	244	
	045C21A	188	
	039C21A	175	
	052c21a	106	
	077C21B	63	547
D	088D21A	428	
	011D21A	380	
	006d21a	357	
	091d21a	322	
	009D21A	321	
	026d21a	278	
	039D21A	202	
	007d21a	95	
	066D21A	74	

	004D21A	69	
	025D21A	49	
	040D21A	45	218
E	050E21A	711	
	052E21A	569	
	053E21A	391	
	017e21a	297	
	049E21A	272	
	062e21a	271	
	058E21A	214	
	059E21A	179	
	061e21a	142	
	051E21A	101	314
F	020F21A	410	
	014F21A	374	
	048f21a	366	
	002F21A	328	
	037F21A	321	
	017F21A	285	
	011F21A	266	
	012F21A	190	
	004f21a	185	
	019f21A	175	
	071F21a	166	
	032F21A	126	
	039f21a	103	
	003F21A	87	
	033F21A	80	
	058f21a	77	
	051F21A	72	
	034F21A	50	203

Boxplot of Subgroups

I used Excel to create a boxplot for all of the data above.

Each box shows the maximum and minimum, mean and interquartile range for the adverse reactions produced by batches in each sub group.
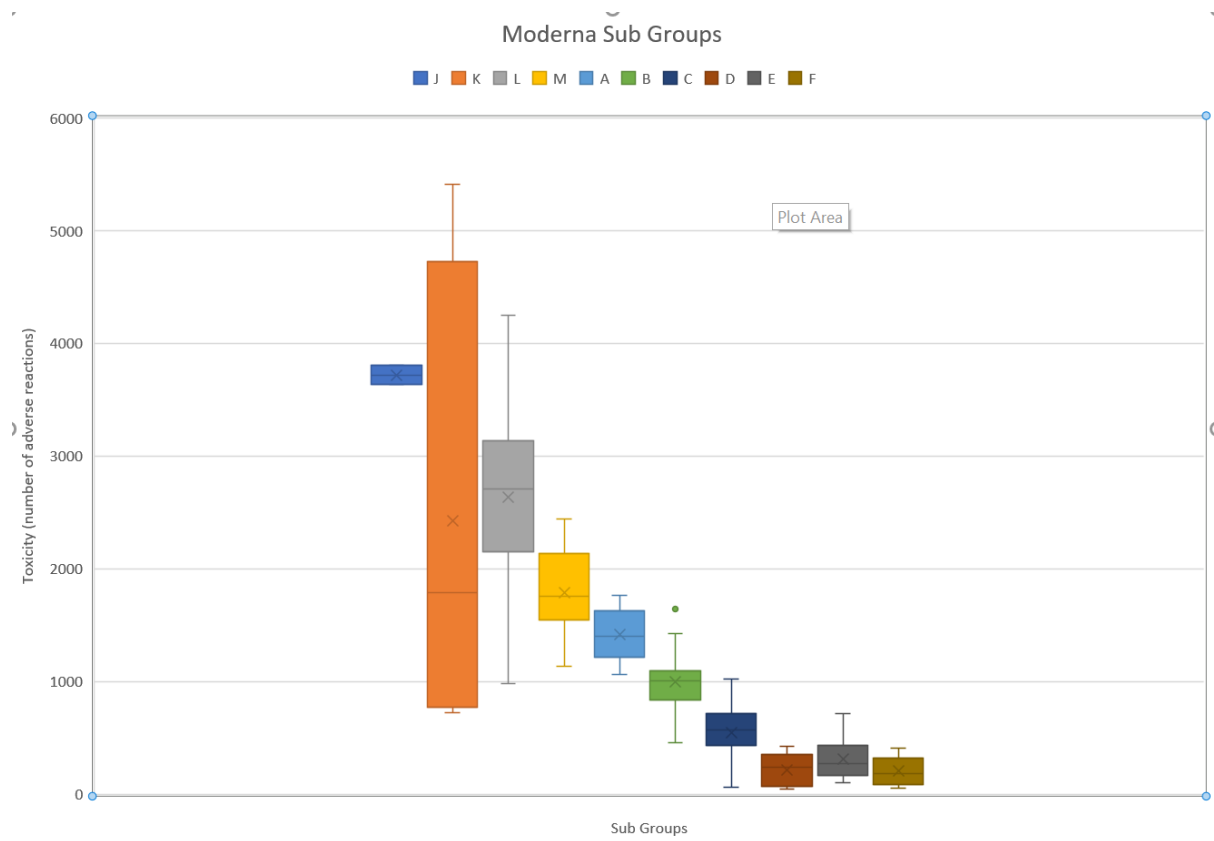
As you can see, as the alphabet ascends, there is a progressive step by step decline in the toxicity of the batches.

Conclusion

There appears to be a zoning of toxicity levels such that

J > K

K > L

L > M

A > B

B > C

C > D

The point being that adverse reactions are not random.

Rather, they are determined by the toxicity of the vaccine batch, which is measured by the number of adverse reactions to that batch.

And the toxicity of the batches have been found to vary systematically, in accordance with the alphanumeric batch code.

Batches of different toxicities have been assigned to different letters of the alphabet, and toxicity decreases in steps as the alphabet ascends.

Additional Notes

1. **Sometimes Moderna gives two batch codes for the same batch - so it halves the number of adverse reactions**

They only do this for very toxic batches e.g. 025J20-2A and 025J20A. They do this simply to lower the apparent number of adverse reactions – by splitting the adverse reactions between two slight modifications of the same batch number. Clever, but deceptive.

2. **Misspellings of Batches Increases the Number of Batches 100 fold and consequently lowers the % of batches that are toxic**

100 misspelled batches containing the letter J. Nearly all the misspellings are simply variations upon two batches. This shows that a much greater % of batches may be highly toxic than was originally thought. Here is a list of the misspellings.

O11J20A	34
11J20A	21
25J20A	21
001J20A	18
02SJ20A	14
0011J20A	11
01J20A	9
D11J20A	8
011-J20A	5
026J20A	5
MOD011J20A	5
011J20A.	4
025j20a-2a	4
O25J20A	4
#025J20A	3
0111J20A	3
013J20A	3
025-J20A	3
02J20A	3
037J20A	3
039J20A	3
010J20A	2
011.J20A	2
011J20A17691231	2
011j20am	2
01ij20a	2
01LJ20A	2
022J20A	2
028J20A	2

05J20A	2
611J20A	2
C11J20A	2
J25J20A	2
Lot # 025J20A	2
O1LJ20A	2
U11J20A	2
U25J20A	1
#011J20A	1
(L) 011J20A	1
)25J20A	1
0025J20A	1
00J20A	1
01/J20A	1
011 J20A	1
0112J20A	1
011J20A 5/21	1
011J20A(Shot 1)	1
011J20A 12/31/2	1
011J20A 2069123	1
011J20A and 028	1
011J20A or 011J	1
011J20A(or 7)	1
011J20A, 004M20	1
011J20A, 028L20	1
011J20A/011T20A	1
011J20A/028L20A	1
011J20A/129200	1
011J20A/12997	1
011J20A/Moderna	1
011J20A011J20A	1
011J20AQ	1
011J20B	1
011J20N	1
011j250A	1
011J26A	1
011J28	1
011J29A	1
011J2D0A	1
011J50A	1
011J7OA	1
011J90A	1
011Jdon	1
011jloa	1
011JO2A	1
011jwa	1
011JZ04	1
011JZDA	1