APPENDIX A

Table of x and a for values of q from $q = 0{\cdot}01\,\%$ to $q = 50{\cdot}0\,\%$. q is the incidence; x is the normal deviate (single-tailed) exceeded by the proportion q; $a\,(= z/q)$ is the mean deviation of these individuals. Note changes of interval in q at $q = 2{\cdot}0\,\%$ and $q = 21{\cdot}0\,\%$. Compiled from Pearson (1931), Comrie (1949), and Fisher & Yates (1943).

q %	x	a	q %	x	a	q %	x	a	q %	x	a
			0·50	2·576	2·892	1·00	2·326	2·665	1·50	2·170	2·525
0·01	3·719	3·960	0·51	2·569	2·886	1·01	2·323	2·662	1·51	2·167	2·522
0·02	3·540	3·790	0·52	2·562	2·880	1·02	2·319	2·658	1·52	2·165	2·520
0·03	3·432	3·687	0·53	2·556	2·873	1·03	2·315	2·655	1·53	2·162	2·518
0·04	3·353	3·613	0·54	2·549	2·868	1·04	2·312	2·652	1·54	2·160	2·515
0·05	3·291	3·554	0·55	2·543	2·862	1·05	2·308	2·649	1·55	2·157	2·513
0·06	3·239	3·507	0·56	2·536	2·856	1·06	2·304	2·645	1·56	2·155	2·511
0·07	3·195	3·464	0·57	2·530	2·850	1·07	2·301	2·642	1·57	2·152	2·508
0·08	3·156	3·429	0·58	2·524	2·845	1·08	2·297	2·639	1·58	2·149	2·506
0·09	3·121	3·397	0·59	2·518	2·839	1·09	2·294	2·636	1·59	2·147	2·504
0·10	3·090	3·367	0·60	2·512	2·834	1·10	2·290	2·633	1·60	2·144	2·502
0·11	3·062	3·341	0·61	2·506	2·829	1·11	2·287	2·630	1·61	2·142	2·499
0·12	3·036	3·317	0·62	2·501	2·823	1·12	2·283	2·627	1·62	2·139	2·497
0·13	3·012	3·294	0·63	2·495	2·818	1·13	2·280	2·624	1·63	2·137	2·495
0·14	2·989	3·273	0·64	2·489	2·813	1·14	2·277	2·621	1·64	2·135	2·493
0·15	2·968	3·253	0·65	2·484	2·808	1·15	2·273	2·618	1·65	2·132	2·491
0·16	2·948	3·234	0·66	2·478	2·803	1·16	2·270	2·615	1·66	2·130	2·489
0·17	2·929	3·217	0·67	2·473	2·798	1·17	2·267	2·612	1·67	2·127	2·486
0·18	2·911	3·201	0·68	2·468	2·793	1·18	2·264	2·609	1·68	2·125	2·484
0·19	2·894	3·185	0·69	2·462	2·789	1·19	2·260	2·606	1·69	2·122	2·482
0·20	2·878	3·170	0·70	2·457	2·784	1·20	2·257	2·603	1·70	2·120	2·480
0·21	2·863	3·156	0·71	2·452	2·779	1·21	2·254	2·600	1·71	2·118	2·478
0·22	2·848	3·142	0·72	2·447	2·775	1·22	2·251	2·597	1·72	2·115	2·476
0·23	2·834	3·129	0·73	2·442	2·770	1·23	2·248	2·594	1·73	2·113	2·474
0·24	2·820	3·117	0·74	2·437	2·766	1·24	2·244	2·591	1·74	2·111	2·472
0·25	2·807	3·104	0·75	2·432	2·761	1·25	2·241	2·589	1·75	2·108	2·470
0·26	2·794	3·093	0·76	2·428	2·757	1·26	2·238	2·586	1·76	2·106	2·467
0·27	2·782	3·081	0·77	2·423	2·753	1·27	2·235	2·583	1·77	2·104	2·465
0·28	2·770	3·070	0·78	2·418	2·748	1·28	2·232	2·580	1·78	2·101	2·463
0·29	2·759	3·060	0·79	2·414	2·744	1·29	2·229	2·578	1·79	2·099	2·461
0·30	2·748	3·050	0·80	2·409	2·740	1·30	2·226	2·575	1·80	2·097	2·459
0·31	2·737	3·040	0·81	2·404	2·736	1·31	2·223	2·572	1·81	2·095	2·457
0·32	2·727	3·030	0·82	2·400	2·732	1·32	2·220	2·570	1·82	2·092	2·455
0·33	2·716	3·021	0·83	2·395	2·728	1·33	2·217	2·567	1·83	2·090	2·453
0·34	2·706	3·012	0·84	2·391	2·724	1·34	2·214	2·564	1·84	2·088	2·451
0·35	2·697	3·003	0·85	2·387	2·720	1·35	2·211	2·562	1·85	2·086	2·449
0·36	2·687	2·994	0·86	2·382	2·716	1·36	2·209	2·559	1·86	2·084	2·447
0·37	2·678	2·986	0·87	2·378	2·712	1·37	2·206	2·557	1·87	2·081	2·445
0·38	2·669	2·978	0·88	2·374	2·708	1·38	2·203	2·554	1·88	2·079	2·444
0·39	2·661	2·969	0·89	2·370	2·704	1·39	2·200	2·552	1·89	2·077	2·442
0·40	2·652	2·962	0·90	2·366	2·701	1·40	2·197	2·549	1·90	2·075	2·440
0·41	2·644	2·954	0·91	2·361	2·697	1·41	2·194	2·547	1·91	2·073	2·438
0·42	2·636	2·947	0·92	2·357	2·693	1·42	2·192	2·544	1·92	2·071	2·436
0·43	2·628	2·939	0·93	2·353	2·690	1·43	2·189	2·542	1·93	2·068	2·434
0·44	2·620	2·932	0·94	2·349	2·686	1·44	2·186	2·539	1·94	2·066	2·432
0·45	2·612	2·925	0·95	2·346	2·683	1·45	2·183	2·537	1·95	2·064	2·430
0·46	2·605	2·918	0·96	2·342	2·679	1·46	2·181	2·534	1·96	2·062	2·428
0·47	2·597	2·911	0·97	2·338	2·676	1·47	2·178	2·532	1·97	2·060	2·426
0·48	2·590	2·905	0·98	2·334	2·672	1·48	2·175	2·529	1·98	2·058	2·425
0·49	2·583	2·898	0·99	2·330	2·669	1·49	2·173	2·527	1·99	2·056	2·423
0·50	2·576	2·892	1·00	2·326	2·665	1·50	2·170	2·525	2·00	2·054	2·421

APPENDIX A (*cont.*)

q %	x	a	q %	x	a	q %	x	a	q %	x	a
2·0	2·054	2·421	7·0	1·476	1·918	12·0	1·175	1·667	17·0	0·954	1·489
2·1	2·034	2·403	7·1	1·468	1·912	12·1	1·170	1·663	17·1	0·950	1·485
2·2	2·014	2·386	7·2	1·461	1·906	12·2	1 165	1·659	17·2	0 946	1·482
2·3	1·995	2·369	7·3	1·454	1·899	12·3	1·160	1·655	17·3	0·942	1·479
2·4	1·977	2·353	7·4	1·447	1·893	12·4	1·155	1·651	17·4	0·938	1·476
2·5	1·960	2·338	7·5	1·440	1·887	12·5	1·150	1·647	17·5	0·935	1·473
2·6	1·943	2·323	7·6	1·433	1·881	12·6	1·146	1·643	17·6	0·931	1·470
2·7	1·927	2·309	7·7	1·426	1·876	12·7	1·141	1·639	17·7	0·927	1·467
2·8	1·911	2·295	7·8	1·419	1·870	12·8	1·136	1·635	17·8	0·923	1·464
2·9	1·896	2·281	7·9	1·412	1·864	12·9	1·131	1·631	17·9	0·919	1·461
3·0	1·881	2·268	8·0	1·405	1·858	13·0	1·126	1·627	18·0	0·915	1·458
3·1	1·866	2·255	8·1	1·398	1·853	13·1	1·122	1·623	18·1	0·912	1·455
3·2	1·852	2·243	8·2	1·392	1·847	13·2	1·117	1·620	18·2	0·908	1·452
3·3	1·838	2·231	8·3	1·385	1·842	13·3	1·112	1·616	18·3	0·904	1·449
3·4	1·825	2·219	8·4	1·379	1·836	13·4	1·108	1·612	18·4	0·900	1·446
3·5	1·812	2·208	8·5	1·372	1·831	13·5	1·103	1·608	18·5	0·896	1·443
3·6	1·799	2·197	8·6	1·366	1·825	13·6	1·098	1·605	18·6	0·893	1·440
3·7	1·787	2·186	8·7	1·359	1·820	13·7	1·094	1·601	18·7	0·889	1·437
3·8	1·774	2·175	8·8	1·353	1·815	13·8	1·089	1·597	18·8	0·885	1·434
3·9	1·762	2·165	8·9	1·347	1·810	13·9	1·085	1·593	18·9	0·882	1·431
4·0	1·751	2·154	9·0	1·341	1·804	14·0	1·080	1·590	19·0	0·878	1·428
4·1	1·739	2·144	9·1	1·335	1·799	14·1	1·076	1·586	19·1	0·874	1·425
4·2	1·728	2·135	9·2	1·329	1·794	14·2	1·071	1·583	19·2	0·871	1·422
4·3	1·717	2·125	9·3	1·323	1·789	14·3	1·067	1·579	19·3	0·867	1·420
4·4	1·706	2·116	9·4	1·317	1·784	14·4	1·063	1·575	19·4	0·863	1·417
4·5	1·695	2·106	9·5	1·311	1·779	14·5	1·058	1·572	19·5	0·860	1·414
4·6	1·685	2·097	9·6	1·305	1·774	14·6	1·054	1·568	19·6	0·856	1·411
4·7	1·675	2·088	9·7	1·299	1·769	14·7	1·049	1·565	19·7	0·852	1·408
4·8	1·665	2·080	9·5	1·293	1·765	14·8	1·045	1·561	19·8	0·849	1·405
4·9	1·655	2·071	9·9	1·287	1·760	14·9	1·041	1·558	19·9	0·845	1·403
5·0	1·645	2·063	10·0	1·282	1·755	15·0	1·036	1·554	20·0	0·842	1·400
5·1	1·635	2·054	10·1	1·276	1·750	15·1	1·032	1·551	20·1	0·838	1·397
5·2	1·626	2·046	10·2	1·270	1·746	15·2	1·028	1·548	20·2	0·834	1·394
5·3	1·616	2·038	10·3	1·265	1·741	15·3	1·024	1·544	20·3	0·831	1·391
5·4	1·607	2·030	10·4	1·259	1·736	15·4	1·019	1·541	20·4	0·827	1·389
5·5	1·598	2·023	10·5	1·254	1·732	15·5	1·015	1·537	20·5	0·824	1·386
5·6	1·589	2·015	10·6	1·248	1·727	15·6	1·011	1·534	20·6	0·820	1·383
5·7	1·580	2·007	10·7	1·243	1·723	15·7	1·007	1·531	20·7	0·817	1·381
5·8	1·572	2·000	10·8	1·237	1·718	15·8	1·003	1·527	20·8	0·813	1·378
5·9	1·563	1·993	10·9	1·232	1·714	15·9	0·999	1·524	20·9	0·810	1·375
6·0	1·555	1·985	11·0	1·227	1·709	16·0	0·994	1·521			
6·1	1·546	1·978	11·1	1·221	1·705	16·1	0·990	1·517	21·0	0·806	1·372
6·2	1·538	1·971	11·2	1·216	1·701	16·2	0·986	1·514	22·0	0·772	1·346
6·3	1·530	1·964	11·3	1·211	1·696	16·3	0·982	1·511	23·0	0·739	1·320
6·4	1·522	1·957	11·4	1·206	1·692	16·4	0·978	1·508	24·0	0·706	1·295
6·5	1·514	1·951	11·5	1·200	1·688	16·5	0·974	1·504	25·0	0·674	1·271
6·6	1·506	1·944	11·6	1·195	1·684	16·6	0·970	1·501	26·0	0·643	1·248
6·7	1·499	1·937	11·7	1·190	1·679	16·7	0·966	1·498	27·0	0·613	1·225
6·8	1·491	1·931	11·8	1·185	1·675	16·8	0·962	1·495	28·0	0·583	1·202
6·9	1·483	1·924	11·9	1·180	1·671	16·9	0·958	1·492	29·0	0·553	1·180
7·0	1·476	1·918	12·0	1·175	1·667	17·0	0·954	1·489	30·0	0·524	1·159

APPENDIX A (*cont.*)

q %	x	a	q %	x	a	q %	x	a	q %	x	a
30·0	0·524	1·159	35·0	0·385	1·058	40·0	0·253	0·966	45·0	0·126	0·880
31·0	0·496	1·138	36·0	0·358	1·039	41·0	0·228	0·948	46·0	0·100	0·863
32·0	0·468	1·118	37 0	0 332	1·020	42·0	0·202	0·931	47·0	0·075	0·846
33·0	0·440	1·097	38·0	0·305	1·002	43·0	0·176	0·913	48·0	0·050	0·830
34·0	0·412	1·078	39·0	0·279	0·984	44·0	0·151	0·896	49·0	0·025	0·814
35·0	0·385	1·058	40·0	0·253	0·966	45·0	0·126	0·880	50·0	0·000	0·798

For incidences (q) over 50 %, take the tabulated value of x corresponding to $1-q$, but give it a negative sign: take the tabulated value of a corresponding to $1-q$ and multiply this by $(1-q)/q$, retaining the positive sign.

APPENDIX B

Summary of formulae for computing the regression, b, of relatives on propositi in respect of liability, and the sampling variance, V_b, of the estimate

The heritability, h^2, is given by $h^2 = 2b$, when the relatives are full sibs, parents, or children of the propositi, and the standard error of the estimate of the heritability is $2\sqrt{V_b}$. The quantities x and a are obtained from the table (Appendix A) and correspond to the observed incidence denoted by the subscript. Subscripts outside the brackets refer to all the quantities within the brackets. Other symbols are: q = observed incidence; $p = 1-q$; A = number of affected individuals in the sample from which the incidence is calculated: $a' = a\left(\frac{p-q}{p}\right)$ where q is the incidence from which a is derived;

$$W = p/a^2A$$

where p, a, and A correspond to the incidence denoted by the subscript to W. Each of the four methods is based on different observed incidences, as indicated.

Observed incidences and subscripts denoting them

General population, comparable with affected individuals g
General population, comparable with relatives gr
Relatives of normal controls c
Relatives of affected individuals r

Method 1. Two incidences: g and r

$$b = \frac{x_g - x_r}{a_g}, \quad V_b = [1/a - b(a-x)]_g^2 W_g + (1/a)_g^2 W_r.$$

Method 2. Two incidences: c and r.

$$b = \frac{p_c(x_c - x_r)}{a_c}, \quad V_b = [p/a - b(a'-x)]_c^2 W_c + (p/a)_c^2 W_r.$$

Method 3. Three incidences: g, gr and r

$$b = \frac{x_{gr} - x_r}{a_g}, \quad V_b = [b(a-x)]_g^2 W_g + (1/a)_g^2 (W_{gr} + W_r).$$

Method 4. Three incidences: g, c and r

$$b = \frac{p_g(x_c - x_r)}{a_g}, \quad V_b = [b(a'-x)]_g^2 W_g + (p/a)_g^2 (W_c + W_r).$$