Underlying beliefs linked to public opinion about gene drive and pest-specific toxin for pest control

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Table S1. Confirmatory factor analysis (CFA) for constructs related to level of support for gene drive.

Construct	Belief	Standardised loading	Goodness of fit indicators			
			χ^2/df	CFI	TLI	RMSEA
Elicited attitudinal beliefs	I think it's important to reduce the number of rats in New Zealand	.14	1.131	.990	.990	.008
	The use of gene drive would protect New Zealand's native wildlife by reducing the number of rats	.45				
	Reducing rat numbers via gene drive would protect humans from diseased spread by rats	.39				
	Using gene drive to control rat numbers would result in less chemicals being used	.31				
	Gene drive would be a humane way to rid New Zealand of rats	.46				
	Gene drive would be going against the natural way of life	-.62				
	I am concerned that the use of gene drive in rats could lead to mutations in other animals	-.79				
	I am concerned that there are unknown consequences to using gene drive to control rats	-.80				
	I am concerned that the use of gene drive in rats could lead to mutations and produce super rats	-.71				
	I am concerned that gene drive could have unforeseen effects that are harmful to humans	-.84				
Global attitudinal beliefs	Overall, I think gene drive to control rats is extremely beneficial	.83	6.495	.989	.975	.051
	Overall, I think gene drive to control rats is extremely good	.97				
	Overall, I think gene drive to control rats is extremely valuable	.89				
	Overall, I think gene drive to control rats is extremely risky	.86				
Elicited normative beliefs	Department of Conservation	.87	19.708	.969	.934	.09
	Scientists	.66				
	Farmers	.57				
	Forest and Bird	.81				
	Environmentalists	.59				
	Animal rights groups	.34				
	Government	.70				

Global normative beliefs	People in my household would support the use of gene drive	.91	13.170	.995	.993	.075
	People like me would support the use of gene drive to controls rats	.90				
	People who are important to me would support the use of gene drive	.91				
Elicited control beliefs	If the government supported it	.76	23.353	.950	.918	.102
	If universities supported it	.78				
	If businesses supported it	.61				
	If iwi or hapu supported it	.62				
	If scientific evidence can prove it works	.73				
	If there is open and honest information about the pros and cons of gene drive	.65				
	If there were strict controls only to be used for conservation	.67				
	If I had a say/was consulted in its use	.55				

Table S2. Confirmatory factor analysis (CFA) for constructs related to level of support for aerial distribution of new pest-specific toxin.

Construct	Belief	Standardised loading	χ^2/df	CFI	TLI	RMSEA
			Goodness of fit indicators			
Elicited attitudinal beliefs	A pest specific toxin to kill rats would be more cost effective	.36	5.801	.993	.987	.047
	A pest specific toxin would harm our waterways	-.84				
	A pest specific toxin would be harmful/irritant to people	-.86				
	It is impossible to make a pest specific toxin that would not harm our native wildlife	-.62				
	Aerial spraying of a pest specific toxin could affect areas outside the target zone	-.84				
	A pest specific toxin that is distributed by aircraft can eradicate rats from a large area effectively	.41				
Global attitudinal beliefs	Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely beneficial	.83	6.085	.999	.996	.049
	Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely good	.97				
	Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely valuable	.88				
	Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely risky	.90				
Elicited normative beliefs	Department of Conservation	.82	21.657	.969	.918	.098
	Scientists	.60				
	Farmers	.53				
	Forest and Bird	.70				
	Environmentalists	.53				
	Animal rights groups	.48				
	Government	.65				

Global normative beliefs	People in my household would support the use aerial distribution of a new pest specific toxin to control rats	.91	6.395	.998	.997	.050
	People like me would support the use of aerial distribution of a new pest specific toxin to control rats	.90				
	People who are important to me would support the use of aerial distribution of a new pest specific toxin to control rats	.93				
Elicited control beliefs	If relevant groups have a chance to comment on its use	.73	28.498	.987	.960	.113
	If there is scientific evidence to validate its use	.77				
	If there is information presented about its long-term impact on the environment	.76				

Table S3. Correlation matrix for beliefs related to level of support for gene drive.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	Construct	Alpha
1. Support for gene drive	1	.470	.646	.564	.526	.685	-.527	-.537	-.532	-.494	-.579	.825	.933	.867	.854	.425	.446	.370	.338	.216	.079	.330	.751	.797	.709	.499	.427	.434	.308	.591	.451	.428	.264	Support	0.958
2. I think it's important to reduce the number of rats in New Zealand	.470	1	.492	.413	.417	.447	-.247	-.188	-.139	-.161	-.207	.461	.464	.453	.394	.319	.331	.275	.251	.128	-0.007	.238	.397	.444	.372	.298	.266	.259	.173	.429	.354	.313	.173		
3. The use of gene drive would protect New Zealand's native wildlife by reducing the number of rats	.646	.492	1	.554	.578	.617	-.304	-.357	-.301	-.337	-.367	.597	.632	.639	.565	.421	.425	.311	.359	.231	0.040	.303	.557	.602	.524	.404	.336	.322	.240	.510	.436	.405	.215		
4. Reducing rat numbers via gene drive would protect humans from diseased spread by rats	.564	.413	.554	1	.503	.541	-.293	-.303	-.308	-.260	-.329	.500	.552	.547	.523	.288	.341	.303	.244	.142	.054	.284	.523	.541	.493	.420	.344	.372	.254	.439	.321	.307	.262		
5. Using gene drive to control rat numbers would result in less chemicals being used	.526	.417	.578	.503	1	.574	-.207	-.247	-.175	-.247	-.253	.466	.510	.534	.459	.331	.397	.263	.296	.187	0.036	.243	.467	.513	.424	.362	.345	.302	.233	.452	.416	.389	.284	Elicited attitude	0.5
6. Gene drive would be humane way to rid New Zealand of rats	.685	.447	.617	.541	.574	1	-.352	-.378	-.314	-.338	-.400	.643	.664	.655	.599	.359	.386	.280	.280	.183	.077	.281	.602	.629	.549	.385	.338	.308	.250	.489	.400	.376	.230		
7. Gene drive would be going against the natural way of life	-.527	-.247	-.304	-.293	-.207	-.352	1	.467	.538	.453	.496	-.463	-.516	-.451	-.521	-.178	-.224	-.139	-.102	-.068	-.049	-.158	-.414	-.434	-.388	-.275	-.251	-.250	-.160	-.276	-.141	-.122	-.093		
8. I am concerned that the use of gene drive in rats could lead to mutations in other animals	-.537	-.188	-.357	-.303	-.247	-.378	.467	1	.624	.674	.682	-.487	-.522	-.477	-.546	-.184	-.213	-.163	-.127	-.066	0.022	-.143	-.413	-.439	-.384	-.269	-.217	-.215	-.138	-.278	-.160	-.122	-0.042		
9. I am concerned that there are unknown consequences to using gene drive to control rats	-.532	-.139	-.301	-.308	-.175	-.314	.538	.624	1	.560	.703	-.468	-.504	-.439	-.570	-.150	-.165	-.154	-.099	-.080	-0.024	-.155	-.449	-.463	-.429	-.293	-.212	-.296	-.161	-.219	-.058	-.052	-.071		
10. I am concerned that the use of gene drive in rats could lead to mutations and produce super rats	-.494	-.161	-.337	-.260	-.247	-.338	.453	.674	.560	1	.610	-.449	-.476	-.444	-.509	-.176	-.235	-.126	-.129	-0.028	0.037	-.144	-.386	-.404	-.353	-.240	-.224	-.185	-.119	-.264	-.174	-.146	-.053		
11. I am concerned that gene drive could have unforeseen effects that are harmful to humans	-.579	-.207	-.367	-.329	-.253	-.400	.496	.682	.703	.610	1	-.527	-.563	-.501	-.604	-.195	-.208	-.175	-.140	-.084	0.022	-.152	-.467	-.473	-.429	-.291	-.208	-.271	-.117	-.285	-.154	-.129	-.056		
12. Overall I think gene drive to control rats is extremely beneficial	.825	.461	.597	.500	.466	.643	-.463	-.487	-.468	-.449	-.527	1	.802	.743	.716	.377	.372	.317	.282	.154	0.007	.267	.619	.672	.581	.422	.338	.339	.225	.529	.411	.381	.212		
13. Overall I think gene drive to control rats is extremely good	.933	.464	.632	.552	.510	.664	-.516	-.522	-.504	-.476	-.563	.802	1	.864	.840	.428	.434	.363	.348	.217	.083	.333	.722	.773	.682	.490	.412	.429	.300	.567	.441	.422	.258	Global attitude	0.932
14. Overall I think gene drive to control rats is extremely valuable	.867	.453	.639	.547	.534	.655	-.451	-.477	-.439	-.444	-.501	.743	.864	1	.766	.454	.467	.366	.354	.212	.059	.342	.680	.733	.648	.489	.414	.412	.315	.578	.466	.442	.268		
15. Overall I think gene drive to control rats is extremely risky	.854	.394	.565	.523	.459	.599	-.521	-.546	-.570	-.509	-.604	.716	.840	.766	1	.373	.378	.326	.288	.198	.088	.313	.669	.705	.636	.463	.389	.428	.269	.508	.369	.363	.231		
16. Department of Conservation	.425	.319	.421	.288	.331	.359	-.178	-.184	-.150	-.176	-.195	.377	.428	.454	.373	1	.591	.482	.710	.487	.262	.557	.391	.421	.387	.393	.338	.287	.302	.423	.377	.383	.250		
17. Scientists	.446	.331	.425	.341	.397	.386	-.224	-.213	-.165	-.235	-.208	.372	.434	.467	.378	.591	1	.475	.489	.373	.186	.526	.415	.456	.400	.423	.420	.317	.297	.527	.454	.407	.245		
18. Farmers	.370	.275	.311	.303	.263	.280	-.139	-.163	-.154	-.126	-.175	.317	.363	.366	.326	.482	.475	1	.431	.294	.154	.446	.340	.360	.325	.373	.282	.393	.245	.351	.305	.304	.264	Elicited norms	0.842
19. Forest and Bird	.338	.251	.359	.244	.296	.280	-.102	-.127	-.099	-.129	-.140	.282	.348	.354	.288	.710	.489	.431	1	.550	.339	.451	.316	.334	.318	.312	.260	.252	.280	.305	.316	.335	.241		
20. Environmentalists	.216	.128	.231	.142	.187	.183	-.068	-.066	-.080	-0.028	-.084	.154	.217	.212	.198	.487	.373	.294	.550	1	.568	.366	.224	.224	.228	.269	.247	.188	.295	.206	.193	.207	.174		
21. Animal rights groups	.079	-0.007	0.040	.054	0.036	.077	-.049	0.022	-0.024	0.037	0.022	0.007	.083	.059	.088	.262	.186	.154	.339	.568	1	.252	.107	.099	.106	.167	.159	.185	.217	0.023	0.024	.069	.126		
22. Government	.330	.238	.303	.284	.243	.281	-.158	-.143	-.155	-.144	-.152	.267	.333	.342	.313	.557	.526	.446	.451	.366	.252	1	.349	.351	.340	.478	.313	.334	.306	.308	.280	.277	.226		
23. People in my household would support the use of gene drive	.751	.397	.557	.523	.467	.602	-.414	-.413	-.449	-.386	-.467	.619	.722	.680	.669	.391	.415	.340	.316	.224	.107	.349	1	.822	.832	.452	.395	.415	.287	.491	.383	.378	.261		
24. People like me would support the use of gene drive to controls rats	.797	.444	.602	.541	.513	.629	-.434	-.439	-.463	-.404	-.473	.672	.773	.733	.705	.421	.456	.360	.334	.224	.099	.351	.822	1	.803	.477	.407	.435	.299	.534	.413	.401	.286	Global norms	0.931
25. People who are important to me would support the use of gene drive	.709	.372	.524	.493	.424	.549	-.388	-.384	-.429	-.353	-.429	.581	.682	.648	.636	.387	.400	.325	.318	.228	.106	.340	.832	.803	1	.451	.377	.416	.287	.456	.350	.354	.258		
26. If the government supported it	.499	.298	.404	.420	.362	.385	-.275	-.269	-.293	-.240	-.291	.422	.490	.489	.463	.393	.423	.373	.312	.269	.167	.478	.452	.477	.451	1	.616	.592	.517	.533	.446	.459	.404		
27. If universities supported it	.427	.266	.336	.344	.345	.338	-.251	-.217	-.212	-.224	-.208	.338	.412	.414	.389	.338	.420	.282	.260	.247	.159	.313	.395	.407	.377	.616	1	.509	.509	.553	.486	.479	.390		
28. If businesses supported it	.434	.259	.322	.372	.302	.308	-.250	-.215	-.296	-.185	-.271	.339	.429	.412	.428	.287	.317	.393	.252	.188	.185	.334	.415	.435	.416	.592	.509	1	.421	.414	.314	.331	.379		
29. If iwi or hapu supported it	.308	.173	.240	.254	.233	.250	-.160	-.138	-.161	-.119	-.117	.225	.300	.315	.269	.302	.297	.245	.280	.295	.217	.306	.287	.299	.287	.517	.509	.421	1	.380	.343	.392	.358	Elicited control	0.874
30. If scientific evidence can prove it works	.591	.429	.510	.439	.452	.489	-.276	-.278	-.219	-.264	-.285	.529	.567	.578	.508	.423	.527	.351	.305	.206	0.023	.308	.491	.534	.456	.533	.553	.414	.380	1	.694	.622	.381		
31. If there is open and honest information about the pros and cons of gene drive	.451	.354	.436	.321	.416	.400	-.141	-.160	-.058	-.174	-.154	.411	.441	.466	.369	.377	.450	.305	.316	.193	0.024	.280	.383	.413	.350	.446	.486	.314	.343	.694	1	.655	.432		
32. If there were strict controls only to be used for conservation	.428	.313	.405	.307	.389	.376	-.122	-.122	-.052	-.146	-.129	.381	.422	.442	.363	.383	.407	.304	.335	.207	.069	.277	.378	.401	.354	.459	.479	.331	.392	.622	.655	1	.388		
33. If I had a say/was consulted in its use	.264	.173	.215	.262	.284	.230	-.093	-0.042	-.071	-.053	-.056	.212	.258	.268	.231	.250	.245	.264	.241	.174	.126	.226	.261	.286	.258	.404	.390	.379	.358	.381	.432	.388	1		

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

Table S4. Correlation matrix for beliefs related to level of aerial distribution of new pest-specific toxin.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Construct	Alpha
1. Support for new pest specific toxin	1	.535**	-.579**	-.628**	-.539**	-.616**	.630**	.816**	.937**	.865**	.884**	.404**	.415**	.415**	.274**	.189**	0.039	.280**	.766**	.804**	.740**	.148**	.501**	.360**	Support	0.96
2. A pest specific toxin to kill rats would be more cost effective	.535**	1	-.273**	-.304**	-.295**	-.316**	.559**	.454**	.517**	.548**	.495**	.299**	.342**	.338**	.204**	.170**	.069	.240**	.497**	.511**	.488**	.156**	.385**	.298**	Elicited attitude	0.48
3. A pest specific toxin would harm our waterways	-.579**	-.273**	1	.733**	.505**	.712**	-.325**	-.488**	-.560**	-.497**	-.604**	-.178**	-.154**	-.218**	-.099**	-.084**	-0.036	-.094**	-.499**	-.519**	-.473**	.089**	-.169**	-.065**		
4. A pest specific toxin would be harmful/irritant to people	-.628**	-.304**	.733**	1	.536**	.713**	-.348**	-.554**	-.610**	-.548**	-.635**	-.219**	-.207**	-.243**	-.107**	-.080**	0.014	-.140**	-.530**	-.553**	-.505**	.057**	-.221**	-.102**		
5. It is impossible to make a pest specific toxin that would not harm our native wildlife	-.539**	-.295**	.505**	.536**	1	.530**	-.324**	-.487**	-.525**	-.478**	-.520**	-.203**	-.217**	-.187**	-.105**	-.057**	.054**	-.109**	-.429**	-.445**	-.418**	.055**	-.255**	-.147**		
6. Aerial spraying of a pest specific toxin could affect areas outside the target zone	-.616**	-.316**	.712**	.713**	.530**	1	-.356**	-.529**	-.600**	-.527**	-.618**	-.227**	-.202**	-.246**	-.137**	-.106**	-0.013	-.140**	-.515**	-.537**	-.494**	.061**	-.207**	-.108**		
7. A pest specific toxin that is distributed by aircraft can eradicate rats from a large area effectively	.630**	.559**	-.325**	-.348**	-.324**	-.356**	1	.529**	.594**	.638**	.567**	.293**	.362**	.320**	.204**	.140**	.045	.257**	.539**	.533**	.513**	.200**	.444**	.356**		
8. Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely beneficial	.816**	.454**	-.488**	-.554**	-.487**	-.529**	.529**	1	.809**	.744**	.733**	.353**	.352**	.326**	.212**	.105**	-.043	.219**	.619**	.656**	.591**	.132**	.466**	.346**	Global attitude	0.94
9. Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely good	.937**	.517**	-.560**	-.610**	-.525**	-.600**	.594**	.809**	1	.852**	.870**	.406**	.397**	.406**	.281**	.182**	0.034	.273**	.731**	.768**	.710**	.144**	.481**	.350**		
10. Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely valuable	.865**	.548**	-.497**	-.548**	-.478**	-.527**	.638**	.744**	.852**	1	.794**	.386**	.419**	.414**	.269**	.194**	.048	.300**	.699**	.725**	.676**	.196**	.518**	.394**		
11. Overall I think the aerial distribution of a new pest specific toxin to control rats is extremely risky	.884**	.495**	-.604**	-.635**	-.520**	-.618**	.567**	.733**	.870**	.794**	1	.380**	.360**	.407**	.255**	.196**	.071	.260**	.718**	.739**	.692**	.100**	.416**	.270**		
12. Department of Conservation	.404**	.299**	-.178**	-.219**	-.203**	-.227**	.293**	.353**	.406**	.386**	.380**	1	.493**	.440**	.579**	.407**	.258**	.537**	.354**	.363**	.352**	.274**	.358**	.330**	Elicited norm	0.82
13. Scientists	.415**	.342**	-.154**	-.207**	-.217**	-.202**	.362**	.352**	.397**	.419**	.360**	.493**	1	.403**	.351**	.318**	.133**	.521**	.359**	.378**	.349**	.281**	.449**	.357**		
14. Farmers	.415**	.338**	-.218**	-.243**	-.187**	-.246**	.320**	.326**	.406**	.414**	.407**	.440**	.403**	1	.301**	.253**	.208**	.418**	.372**	.387**	.381**	.184**	.268**	.206**		
15. Forest and Bird	.274**	.204**	-.099**	-.107**	-.105**	-.137**	.204**	.212**	.281**	.269**	.255**	.579**	.351**	.301**	1	.572**	.431**	.351**	.273**	.275**	.293**	.247**	.236**	.218**		
16. Environmentalists	.189**	.170**	-.084**	-.080**	-.057**	-.106**	.140**	.105**	.182**	.194**	.196**	.407**	.318**	.253**	.572**	1	.636**	.333**	.226**	.220**	.243**	.218**	.128**	.113**		
17. Animal rights groups	0.039	.069	-0.036	0.014	.054**	-0.013	.045	-.043	0.034	.048	.071**	.258**	.133**	.208**	.431**	.636**	1	.239**	.123**	.120**	.150**	.135**	-0.015	-0.026		
18. Government	.280**	.240**	-.094**	-.140**	-.109**	-.140**	.257**	.219**	.273**	.300**	.260**	.537**	.521**	.418**	.351**	.333**	.239**	1	.259**	.278**	.276**	.256**	.291**	.233**		
19. People in my household would support the use aerial distribution of a new pest specific toxin to control rats	.766**	.497**	-.499**	-.530**	-.429**	-.515**	.539**	.619**	.731**	.699**	.718**	.354**	.359**	.372**	.273**	.226**	.123**	.259**	1	.826**	.846**	.126**	.414**	.296**	Global norm	0.94
20. People like me would support the use of aerial distribution of a new pest specific toxin to control rats	.804**	.511**	-.519**	-.553**	-.445**	-.537**	.533**	.656**	.768**	.725**	.739**	.363**	.378**	.387**	.275**	.220**	.120**	.278**	.826**	1	.827**	.137**	.429**	.301**		
21. People who are important to me would support the use of aerial distribution of a new pest specific toxin to control rats	.740**	.488**	-.473**	-.505**	-.418**	-.494**	.513**	.591**	.710**	.676**	.692**	.352**	.349**	.381**	.293**	.243**	.150**	.276**	.846**	.827**	1	.115**	.375**	.278**		
22. If relevant groups have a chance to comment on its use	.148**	.156**	.089**	.057**	.055**	.061**	.200**	.132**	.144**	.196**	.100**	.274**	.281**	.184**	.247**	.218**	.135**	.256**	.126**	.137**	.115**	1	.457**	.517**	Elicited control	0.79
23. If there is scientific evidence to validate its use	.501**	.385**	-.169**	-.221**	-.255**	-.207**	.444**	.466**	.481**	.518**	.416**	.358**	.449**	.268**	.236**	.128**	-0.015	.291**	.414**	.429**	.375**	.457**	1	.679**		
24. If there is information presented about its long-term impact on the environment	.360**	.298**	-.065**	-.102**	-.147**	-.108**	.356**	.346**	.350**	.394**	.270**	.330**	.357**	.206**	.218**	.113**	-0.026	.233**	.296**	.301**	.278**	.517**	.679**	1		

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).