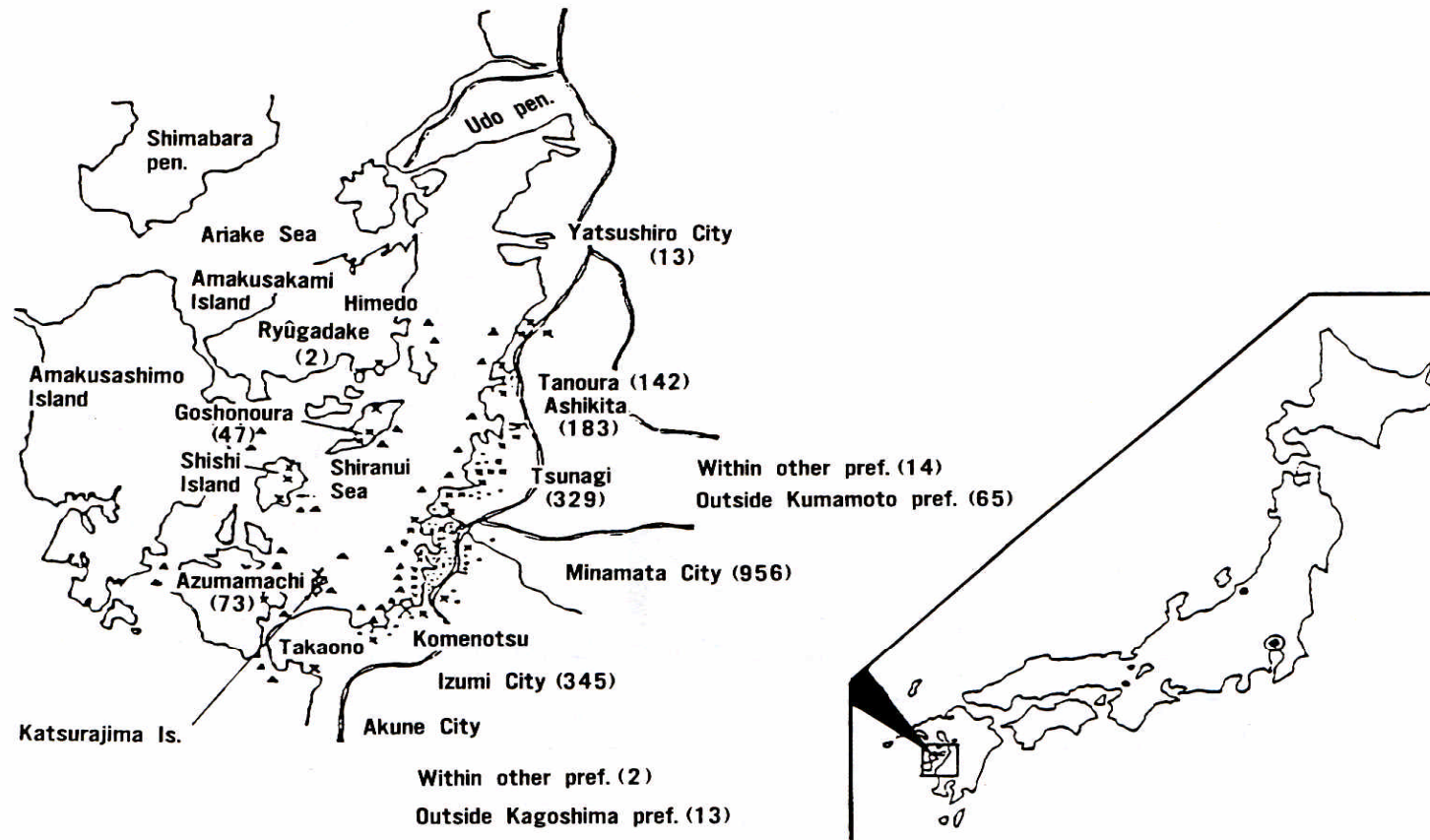




SHIRANUI SEASHORE HEALTH SURVEY 2012

Shigeru Takaoka *et al.*
Minamat Kyoritsu Hospital
Minamata, Japan

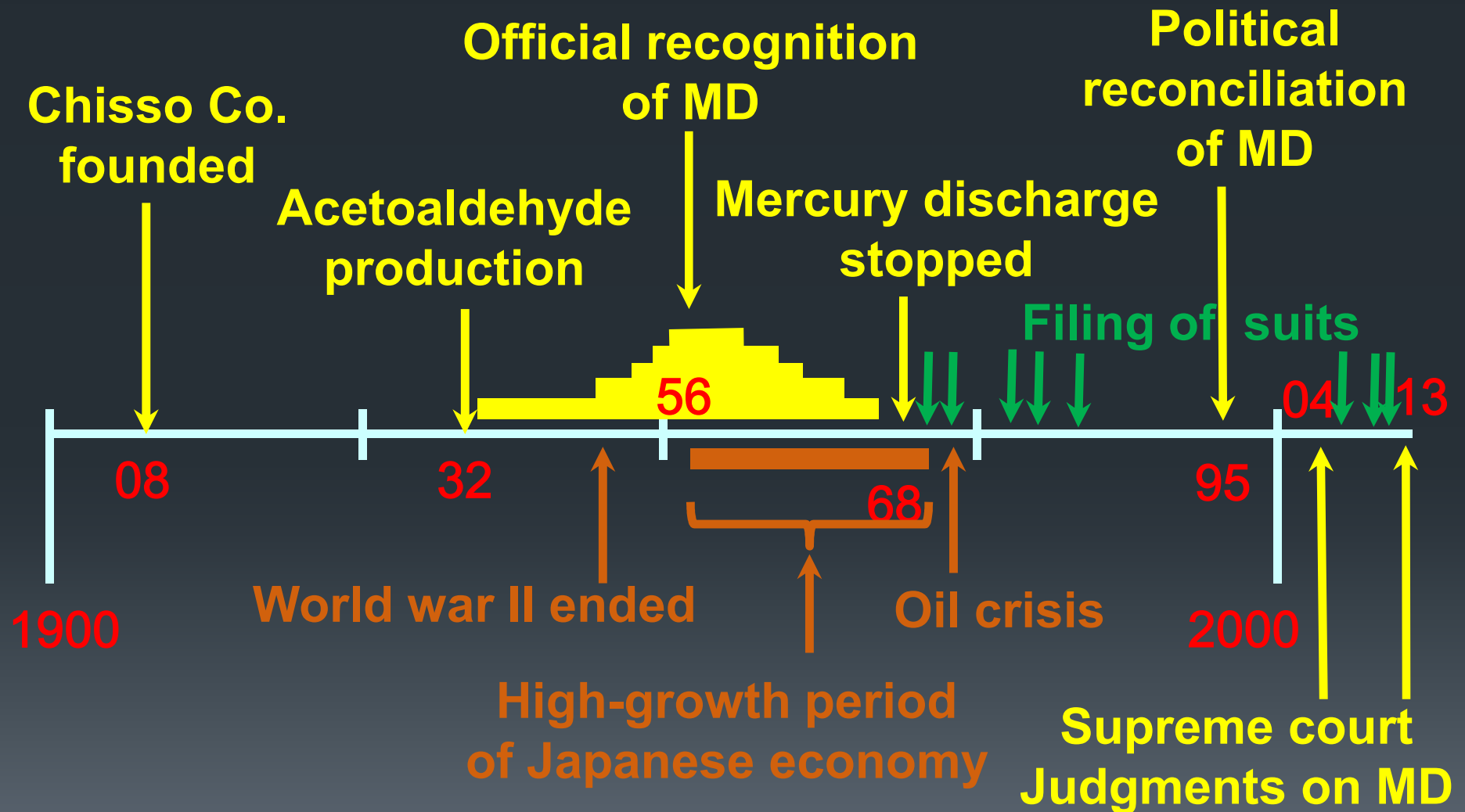
Shiranui Sea – Polluted Area



Figures in (): number of patients

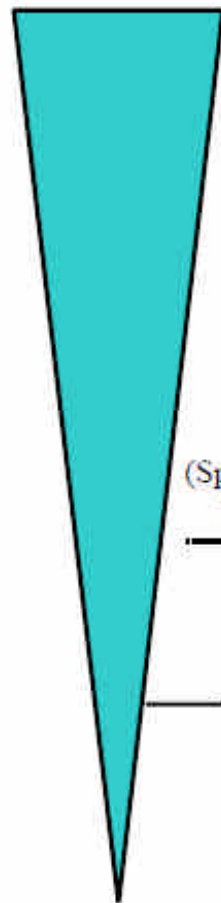
- Patients officially designated through June 1988
- × Where Minamata Disease cats were discovered
- ▲ Where fish were found floating

History of Minamata Disease (MD)



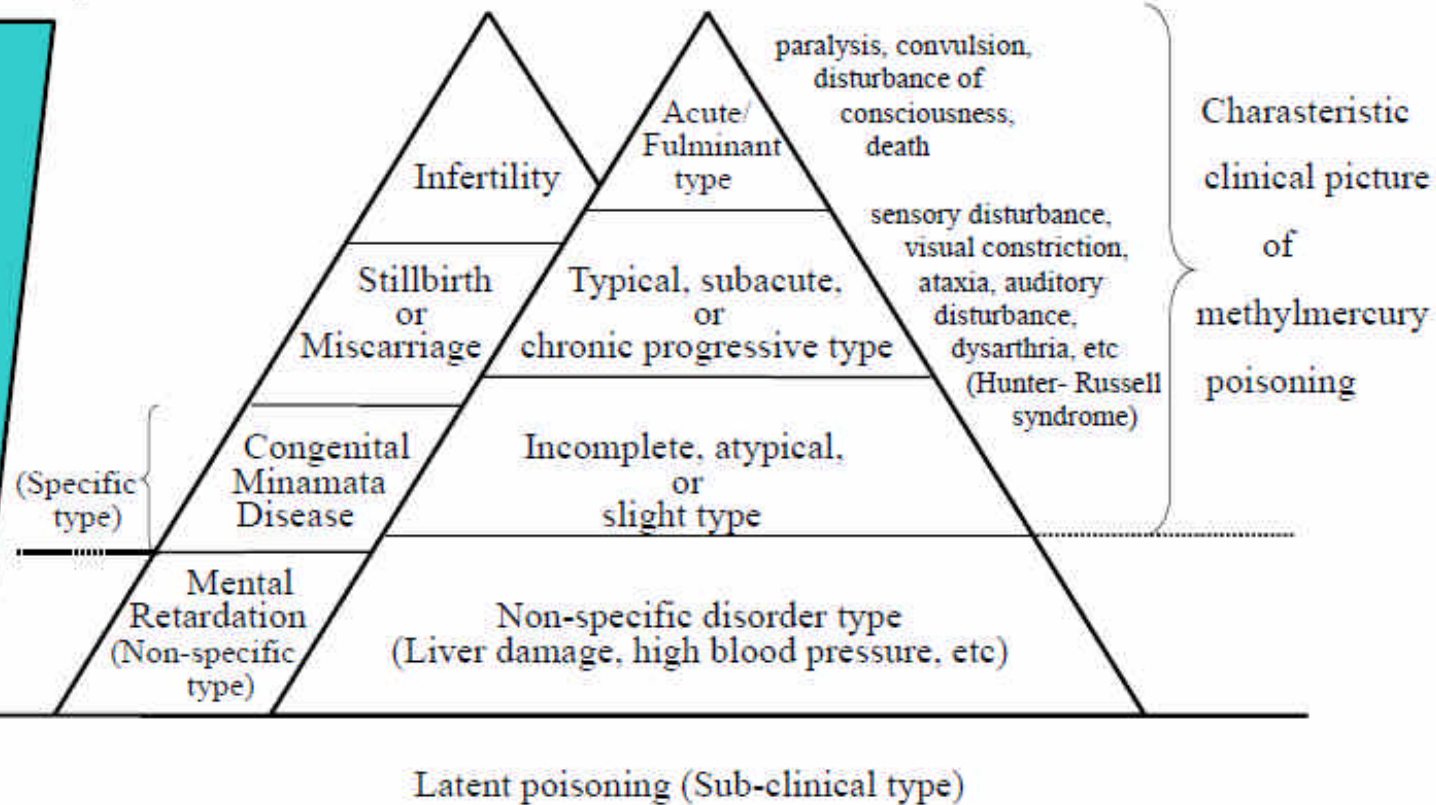
Symptoms and Signs of Methylmercury Poisoning

Methylmercury



Fetus

Adult



Source: Harada, M.

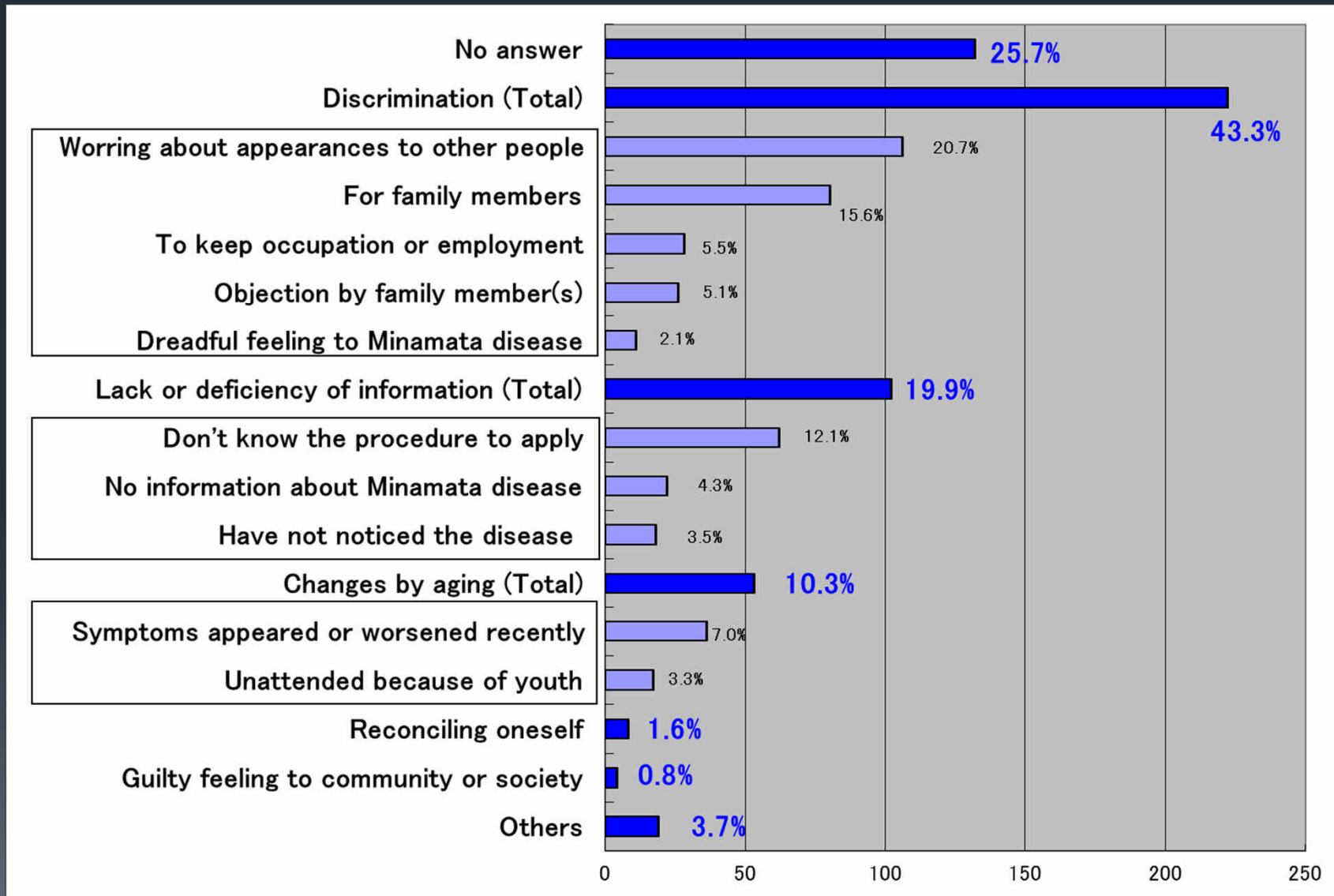
Numbers of MD Patients



Numbers of patients who have applied for or who have received an administrative compensation for Minamata disease. April 30, 2013)

	Kumamoto Prefecture	Kagoshima Prefecture	Total
Certified Patients of Minamata disease (- April, 2013)	1,783	491	2,274
Patients Compensated Partially with Definite Sensory Disturbance (- 1996)	7,225	2,213	9,438
Patients Applying for Certification of Minamata disease (- April, 2013)	252	103	355
Patients Compensated with only Medical Expenses (- July, 2012)	42,961	20,082	63,043
Total	52,221	22,889	75,110

Reason for not Having been Examined Before (November 2004 – April 2005, n=513)




Shiranui Seashore Health Survey 2009 - methods on recruiting subjects



- Time: September 20 and 21, 2009
- Places: Seventeen sites along the Shiranui Seashore
- Subjects: Residents who have lived and ate fish of the Shirnui Sea and who hoped to be examined on methylmercury poisoning.
- Information on the examination was informed through media as TV, newspapers, public information from local government, and so on. The examination applicants were distributed over along the Shiranui seashore thoroughly.
- 1,044 residents took examination and data of 974 subjects who permitted the calculation were analyzed.

Shiranui Seashore Health Survey 2009 - method on examination



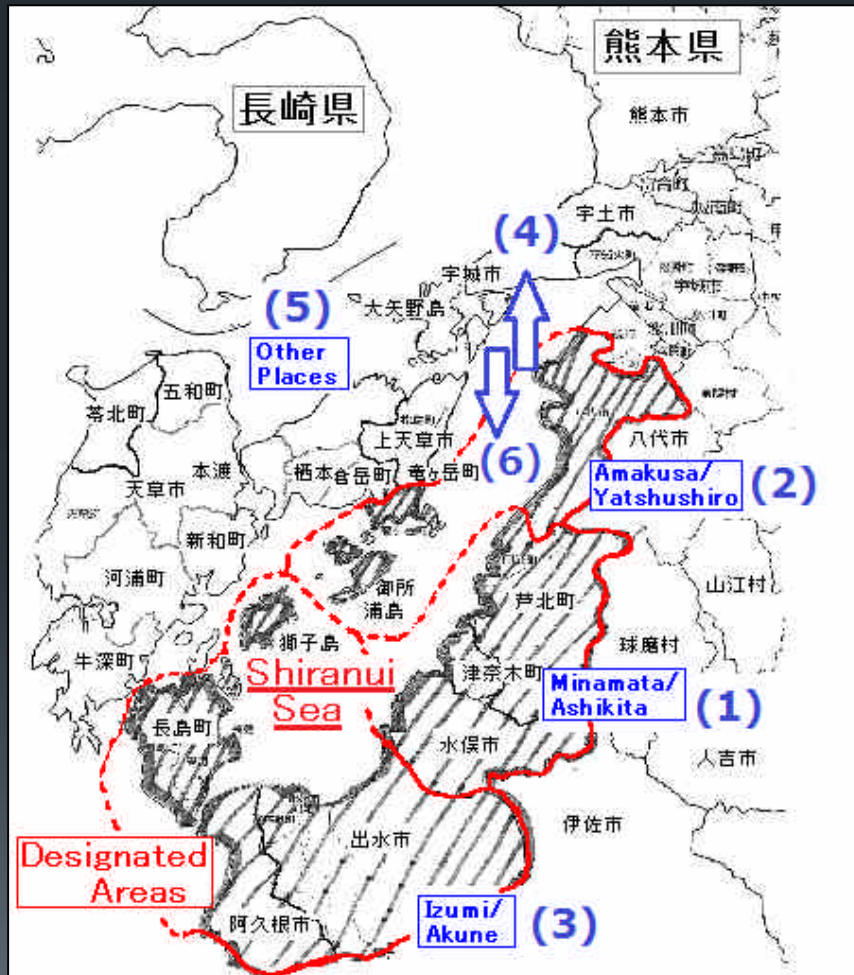
- Surveyed items
 - Histories, Questionnaires
 - Neurological examination
- Doctors (144 members)
 - All doctors received training for neurological examination by documents and video.
 - All subjects received primary and secondary examination by different doctors.
 - Sensory examination was taken twice for all subjects.

Polluted Area

Designated Area by Law

- (1) Minamata / Ashikita Area
- (2) Amakusa / Yatsushiro Area
- (3) Izumi / Akune Area
- (4) (Moved to) Other places

- (5) Has not lived in the Area
- (6) Born or came into the Area after 1969



Age of Each Area



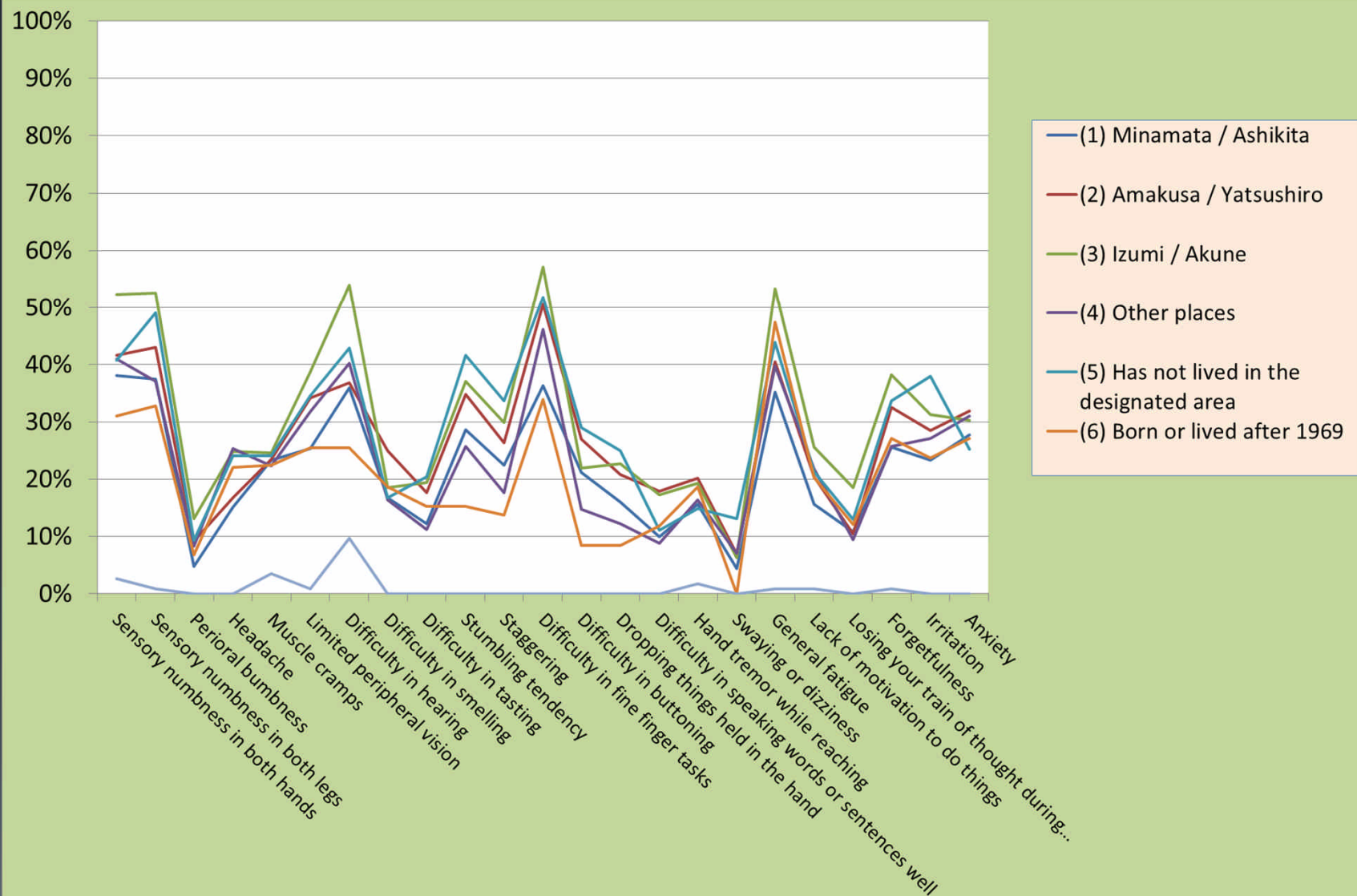
Age	Has lived in the designated area				(5) Has not lived in the area	(6) Born or transferred after 1969	Total	Control
	(1) Minamata / Ashikita	(2) Amakusa / Yatsushiro	(3) Izumi / Akune	(4) Other places				
30s					1	24	25	
40s	31	10	24	29	6	10	110	
50s	58	44	69	63	28	12	274	42
60s	57	54	70	58	35	12	286	38
70s	51	42	56	19	31	1	200	38
80s -	35	16	19	2	7		79	
Total	232	166	238	171	108	59	974	118
Average	64.2±12.7	65.0±10.7	63.6±10.6	58.8±9.4	64.9±10.0	47.3±11.6	62.3±11.8	63.8±9.0

Basic Data on Subjects

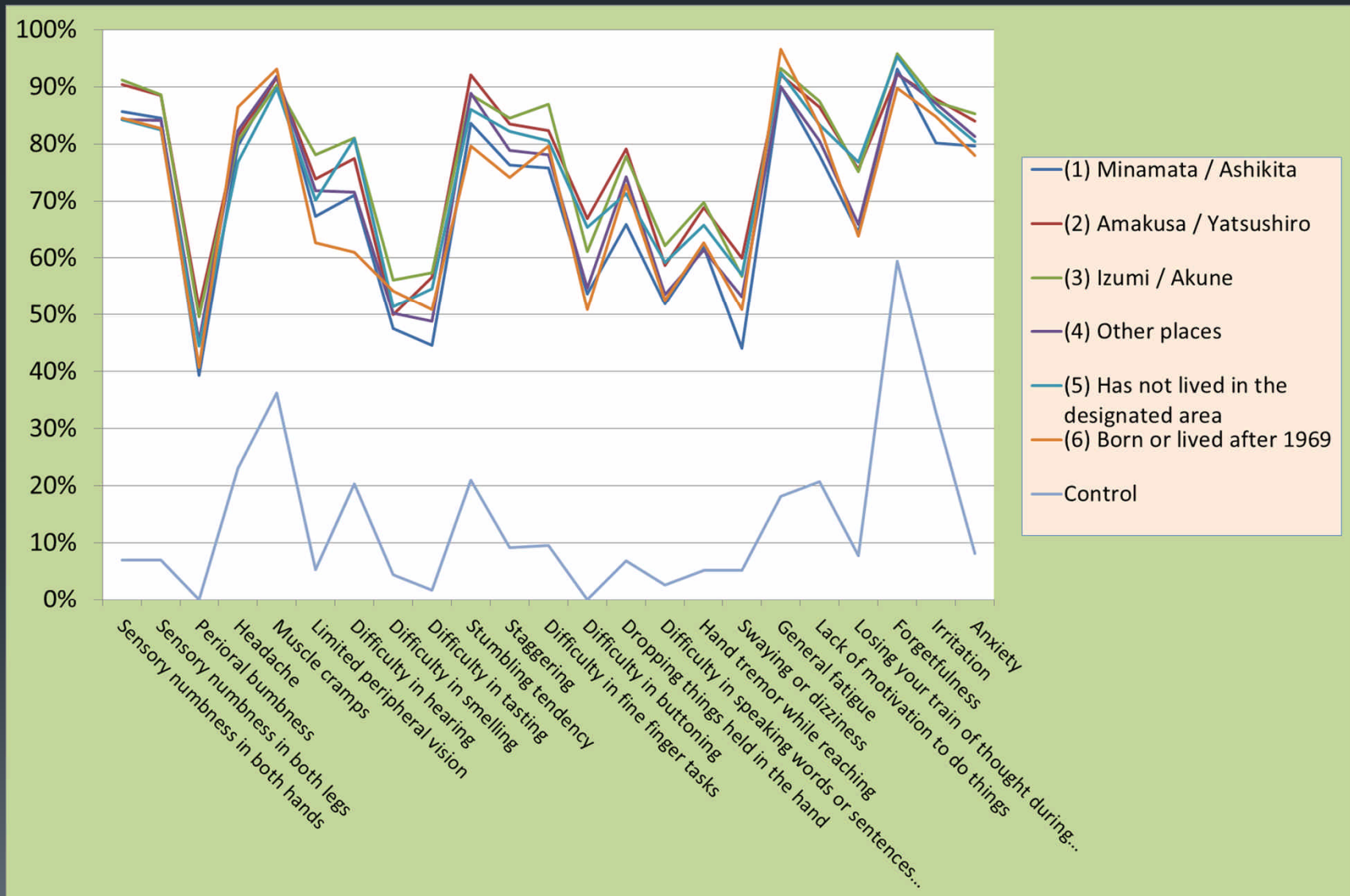


- 178 (18%) of subjects had engaged in fishery related occupation.
- 376 (39%) of subject's parent had engaged in fishery related occupation.
- 547 (56%) of subjects had a family history of Minamata disease.
- Only 112 (11%) of subjects had been examined for Minamata disease.

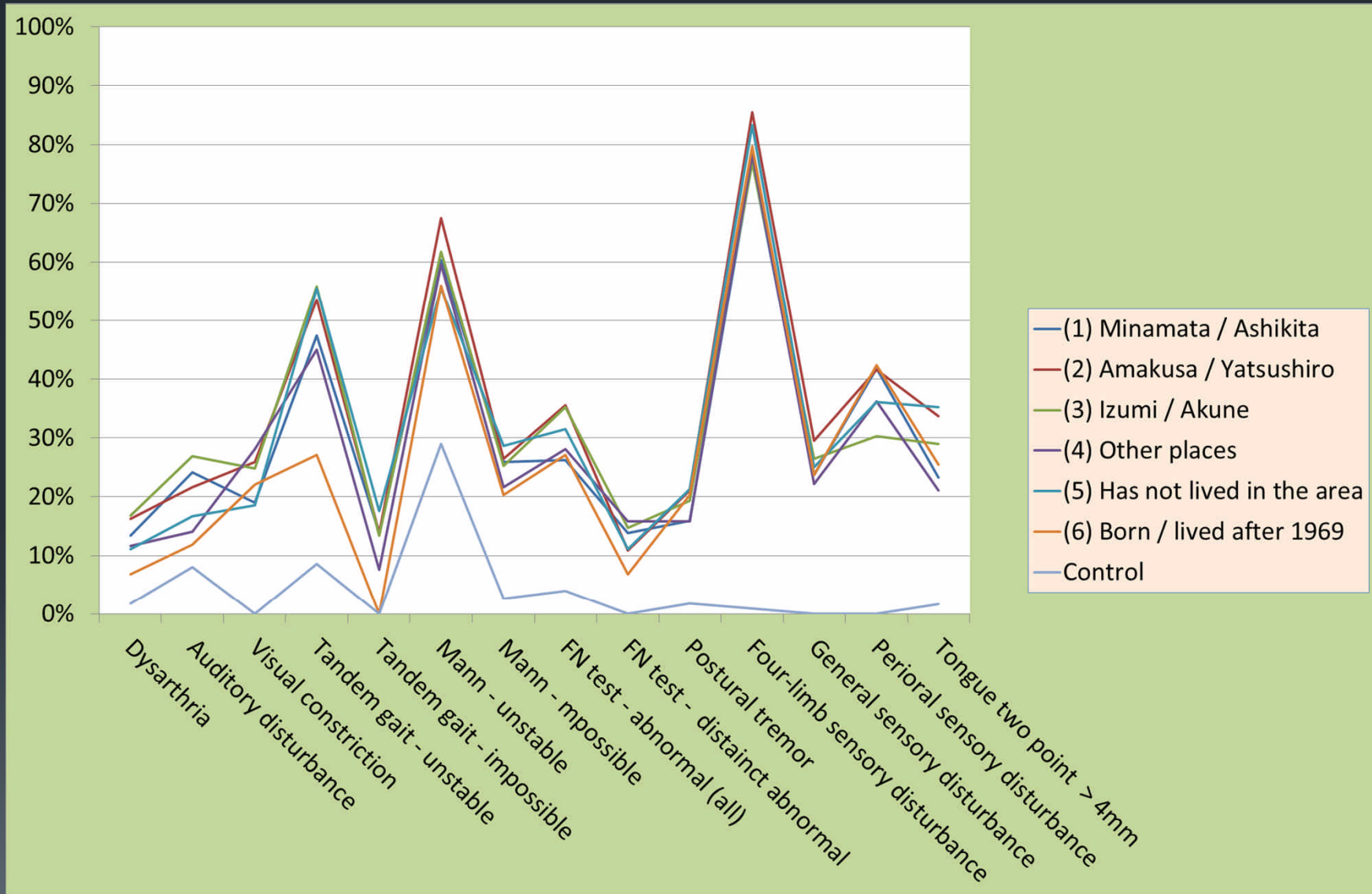
Questionnaire on symptoms (Answer - Always Yes)




Questionnaire on symptoms (Answer - Always or Sometimes Yes)



Neurological signs: Classified by District



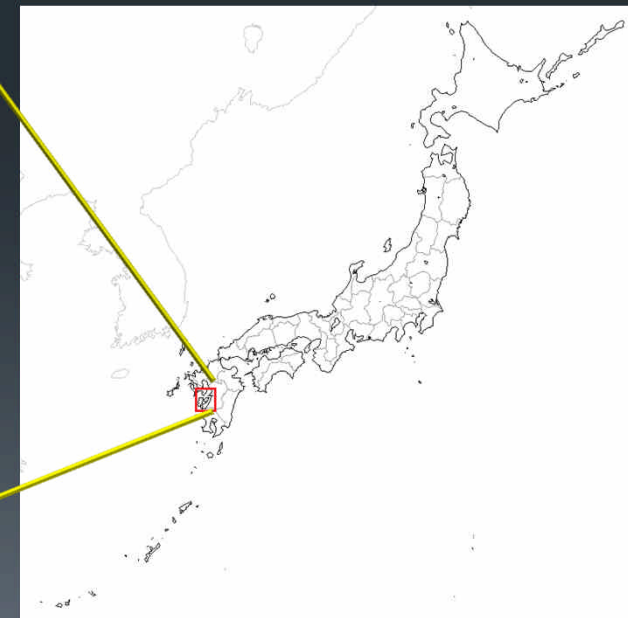
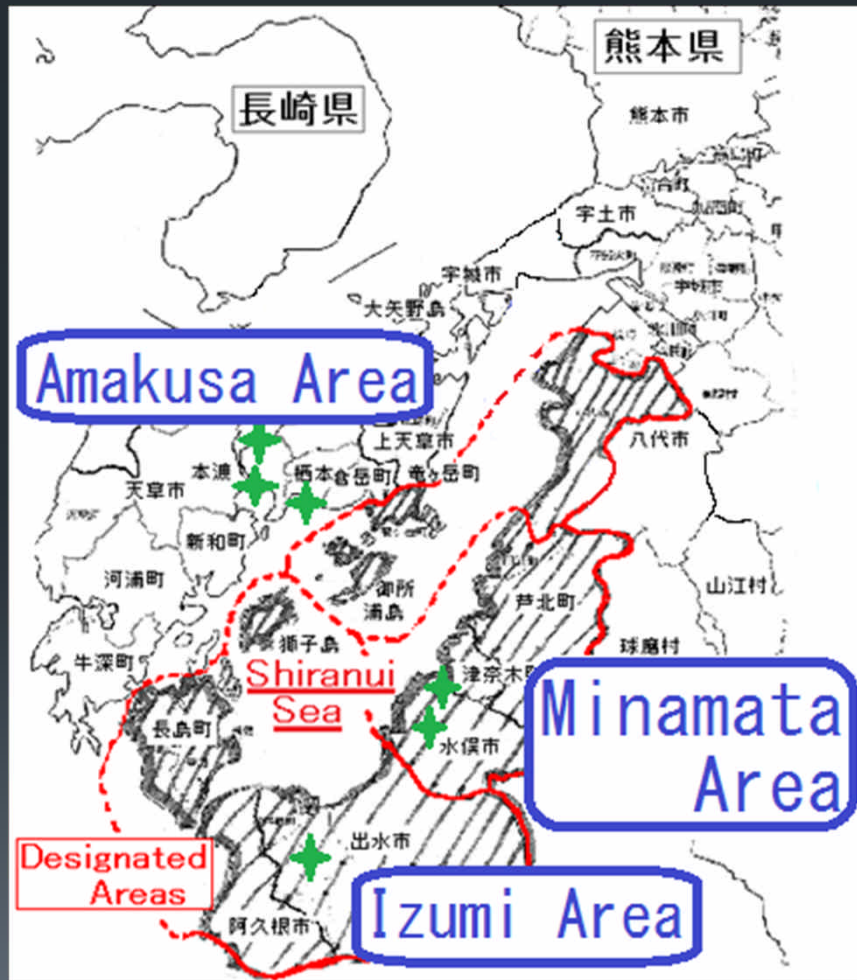
Shiranui Seashore Health Survey 2012 - method on examination



- Surveyed items
 - Histories, Questionnaires
 - Neurological examination
- Doctors (About 140 members)
 - All doctors received training for neurological examination by documents and video.
 - Items of neurological findings were fewer than the survey 2009.
 - Dysarthria, Auditory disturbance, Visual constriction
 - One foot standing, diadokokinesis, tremor
 - Sensory disturbance (pain, touch)

Examination Sites

- (1) Minamata Area: 2 sites
- (2) Amakusa Area: 3 sites
- (3) Izumi Area: 1 sites



Age of Each Erea

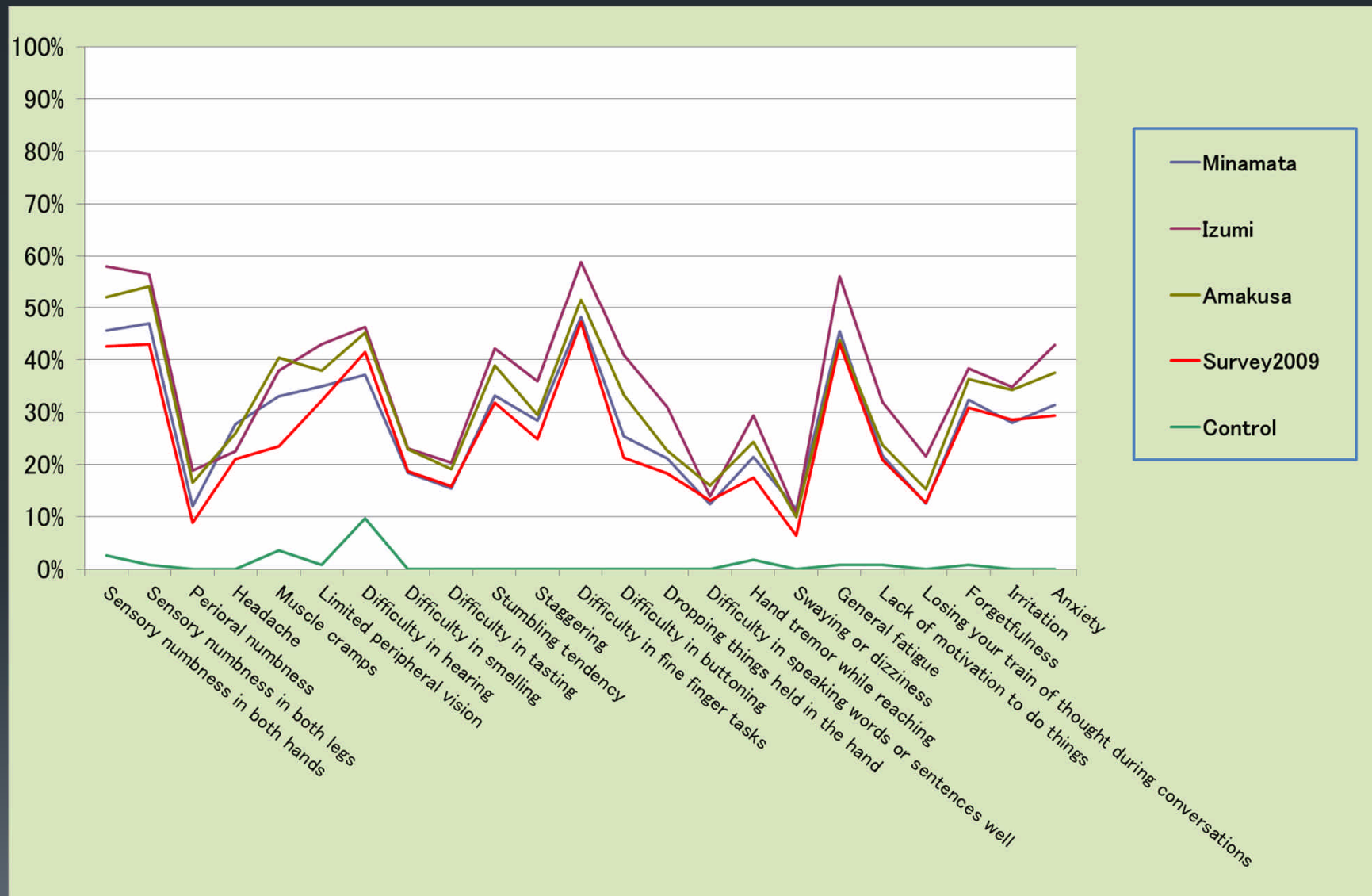
Place	Minamata	Izumi	Amakusa	Total	Examination 2009	Control
30s	12	3	1	16	25	
40s	95	33	63	191	110	
50s	141	71	89	301	274	42
60s	176	73	152	401	286	38
70s	118	64	136	318	200	38
>=80s	70	42	57	169	79	
Total	612	286	498	1396	974	118
Average Age	62.9± 12.8	64.8± 12.6	65.1± 12.4	64.1± 12.4	62.3± 11.8	63.8± 9.0

Basic Data on Subjects

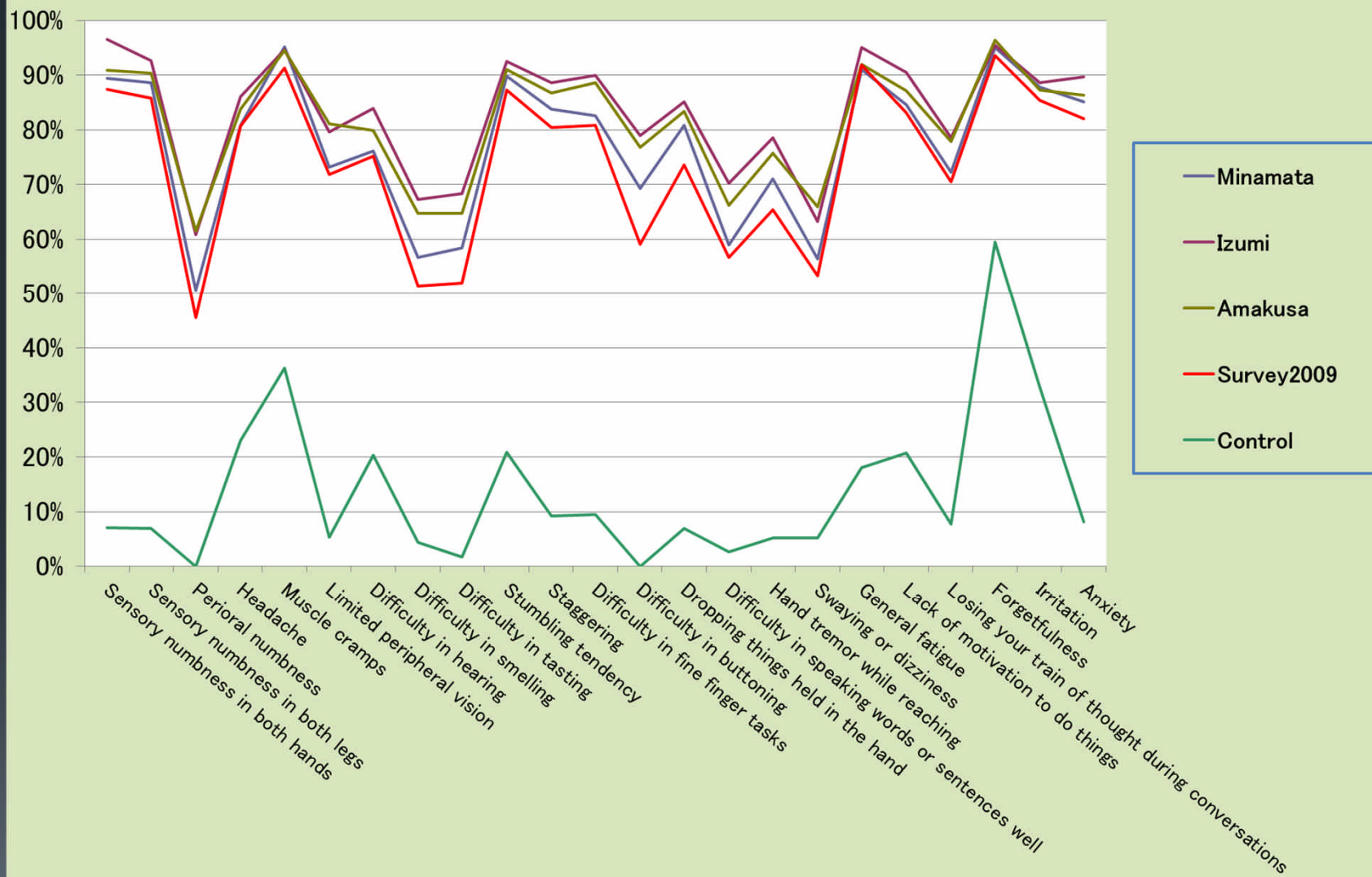


- 156 (11%) of subjects had engaged in fishery related occupation.
- 370 (27%) of subject's parent had engaged in fishery related occupation.
- 738 (53%) of subjects had a family history of Minamata disease.
- Only 85 (6%) of subjects had been examined for Minamata disease.

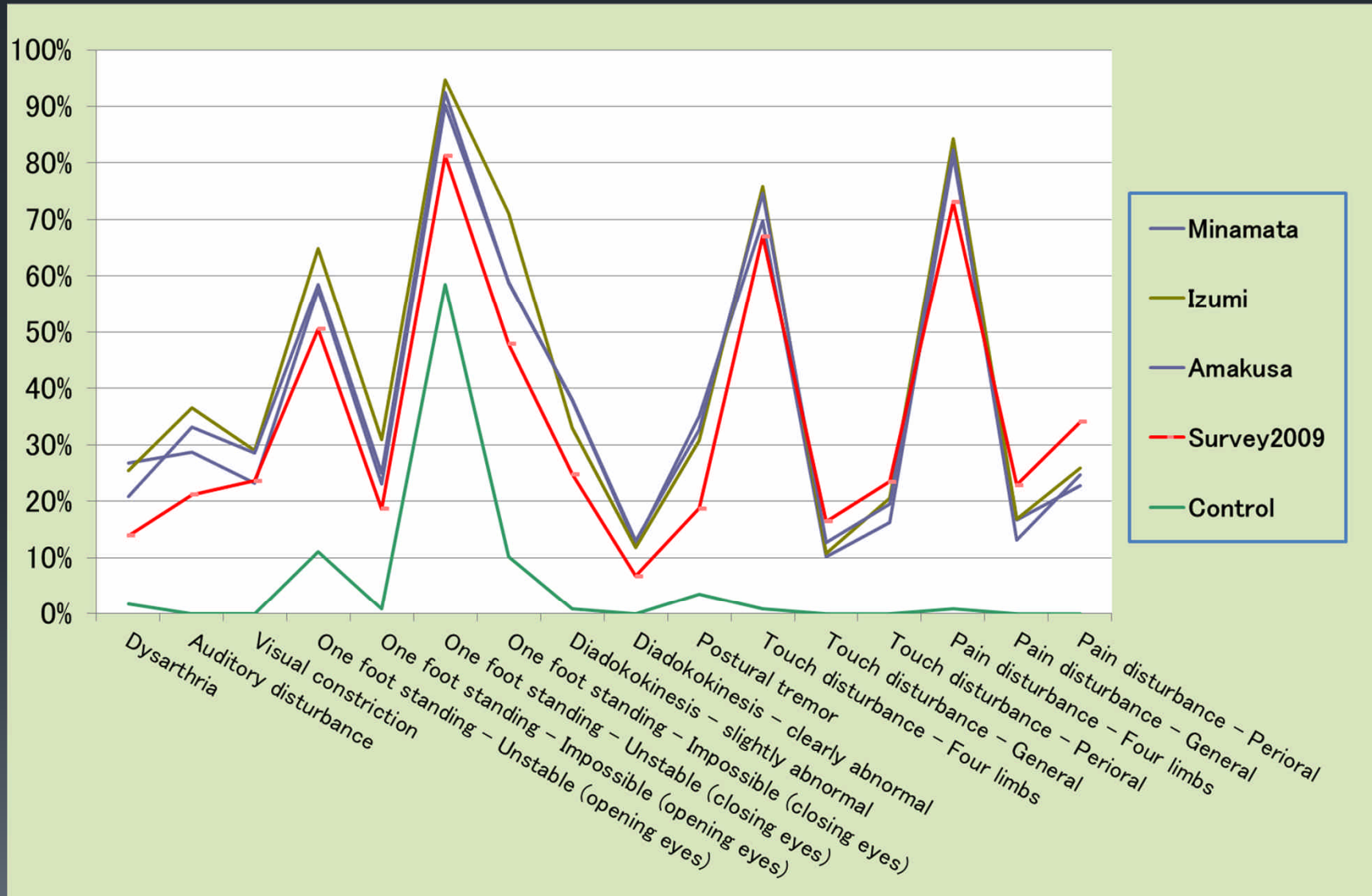
Questionnaire on symptoms (Answer - Always Yes)



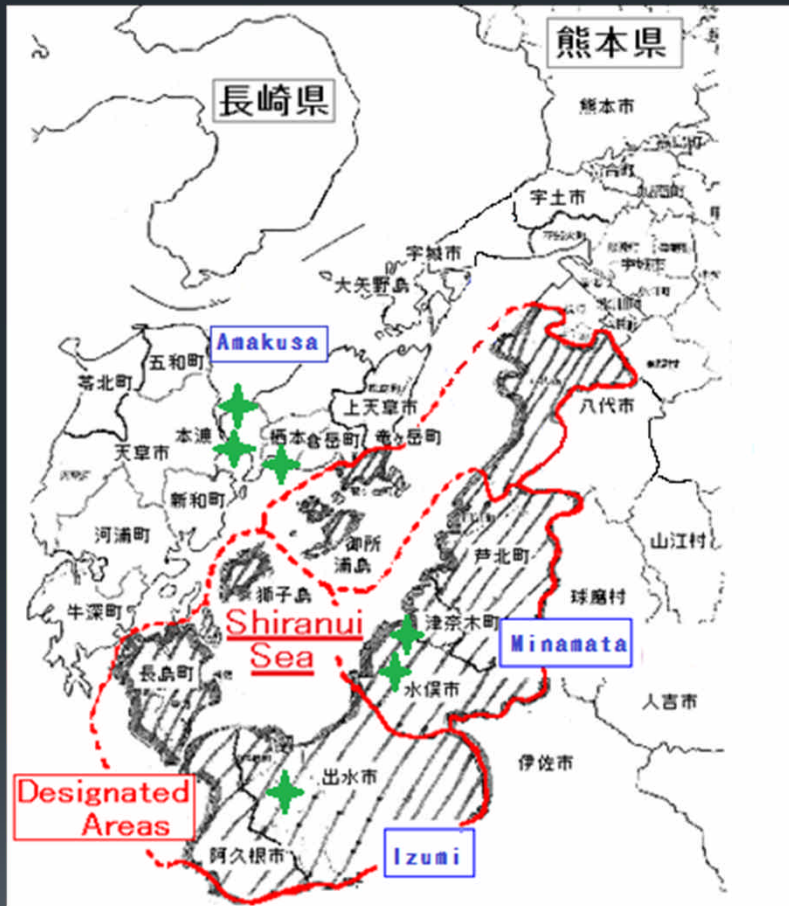
Questionnaire on symptoms (Answer - Always or Sometimes Yes)



Neurological signs



Conditions to be relieved as a victim by Government.



- People who were born before November 30, 1969.
- People who have lived in the designated area (within the red lines) more than 1 year.
- People who lived in the designated area after December 31, 1968 were excluded.
- People who were born after December 1, 1969 must have high concentration of the umbilical cord (more than 1ppm).
- People who have not lived in the designated area must have very strict objective evidence to have eaten the fish from the sea near Minamata City.

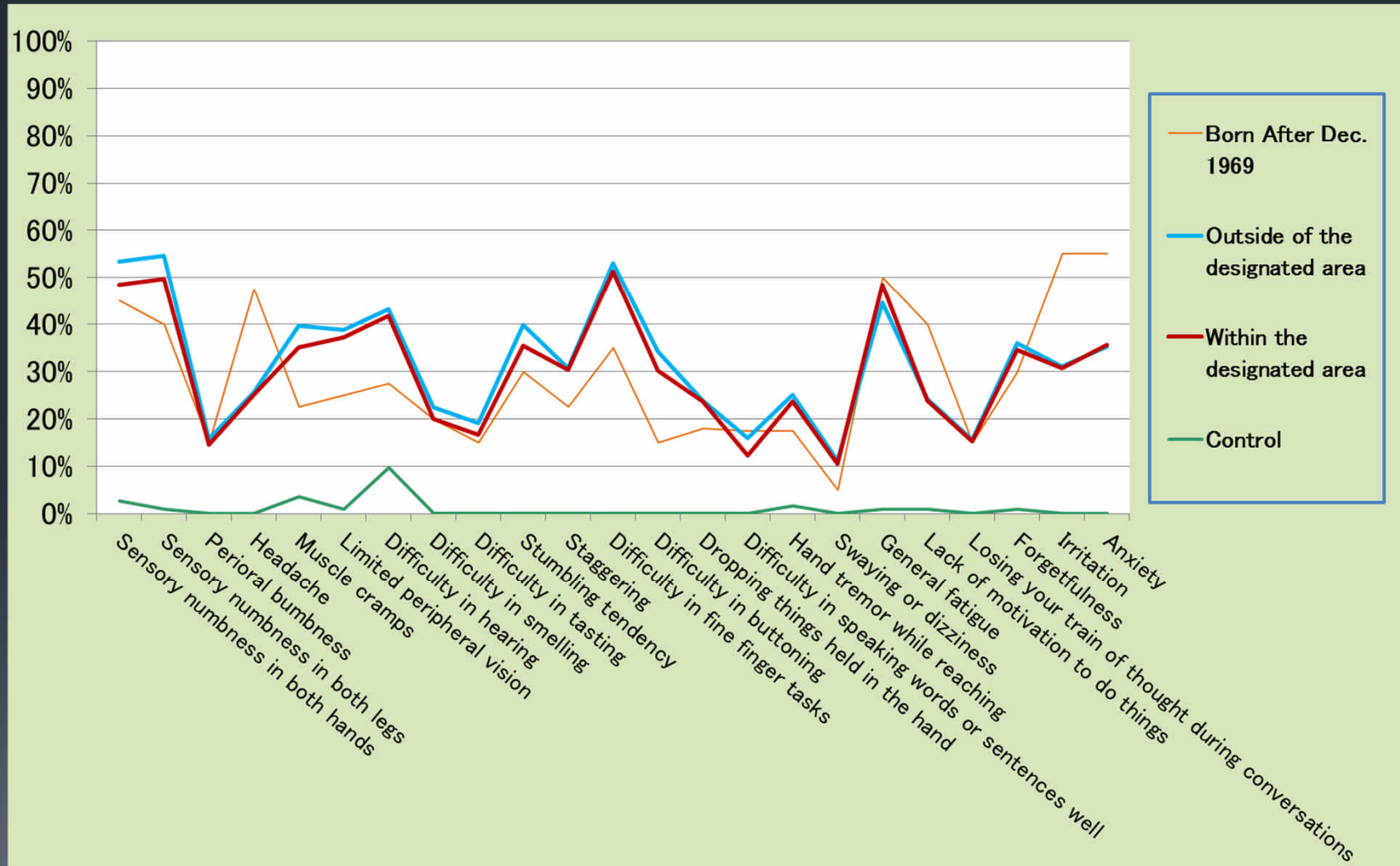
Comparison of the three groups according to the difference of the Government Relief Criteria.



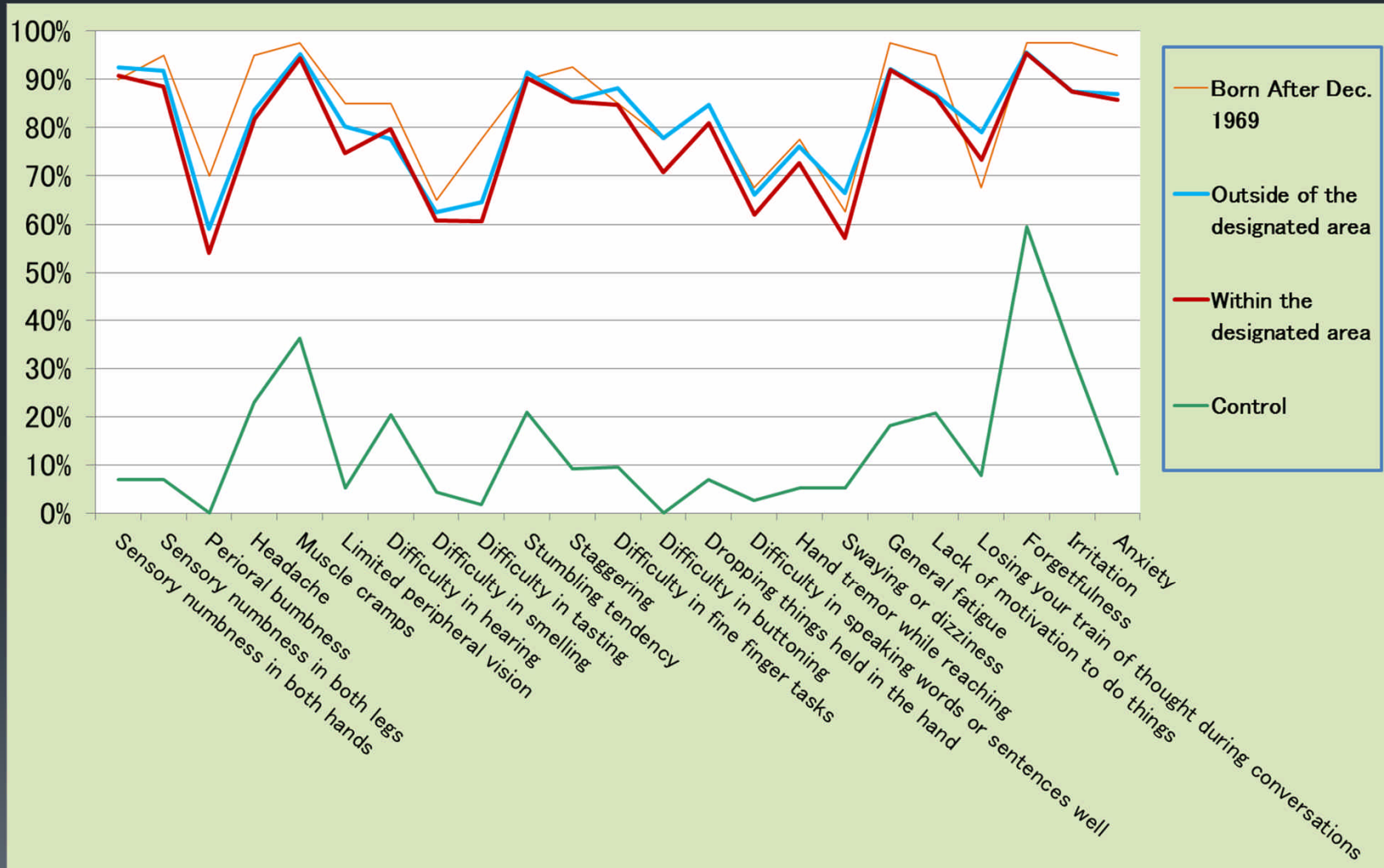
	Within the designated area	Outside of the designated area	People who were born after December 1, 1969
N (F/M)	773 (387/386)	573 (278/295)	41 (18/23)
Average Age	64.6 ± 11.9	65.2 ± 11.8	39.8 ± 2.4

nine cases, whose classification was not clear, were excluded

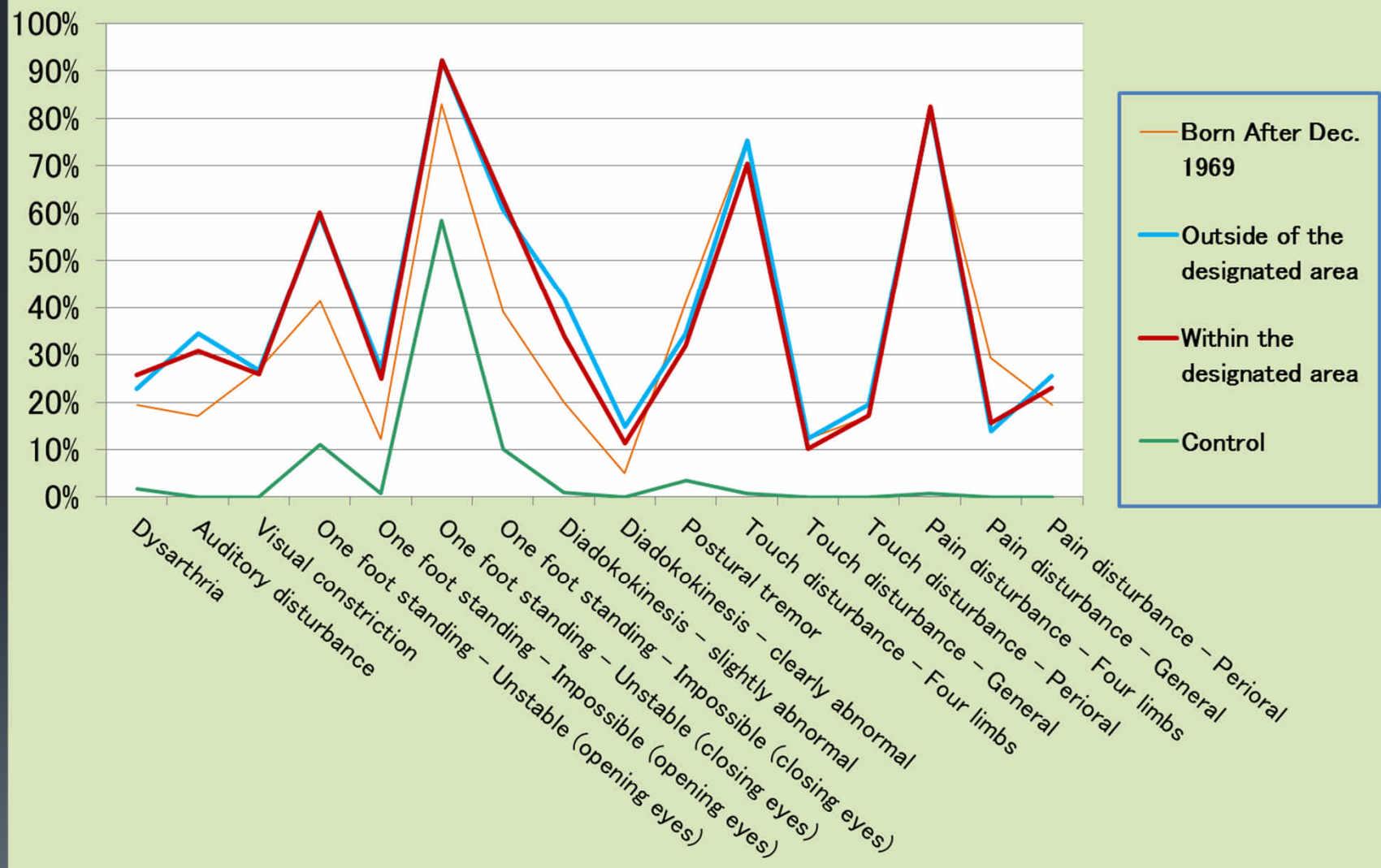
Symptoms of people whose age and residential history match the criteria of the Government or not. (Answer - Always Yes)



Symptoms of people whose age and residential history match the criteria of the Government or not. (Answer - Always or Sometimes Yes)



Neurological signs of people whose age and residential history match the criteria of the Government or not.



Conclusion of the Siranui Survey



- Prevalence of the specific and non-specific symptoms and neurological signs were similar in each area. Confounding factors other than methylmercury cannot explain these similarities.
- Residents in the non-designated areas had the same symptoms and signs as those in the designated areas.
- Residents who were born in or transferred to the polluted areas after 1969 had similar symptoms and signs as well.
- Subjects in this survey were supposed to be only a tip of the iceberg. Victims by methylmercury are supposed to exist more and more chronologically and spatially.
- More research should be done and measures should be taken.