

**Report on Health Surveys of Victims of
the Matsumoto Sarin Attack**



October, 2015
Matsumoto City Council of Community-Based Integrated Care
Matsumoto City

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Greetings

Eiji Momose

Chairman of the Matsumoto City Council of Community-Based Integrated Care

Twenty years after the Matsumoto sarin attack may be an extremely short time not only for Matsumoto City, the afflicted city, but for the world at large, to erase and avoid bringing back the abhorrent memory of a world-shaking event.

Late at night on June 27, 1994, in the quiet neighborhood of the Kitafukashi, Matsumoto City, the western wind carrying an extremely poisonous nerve gas (sarin) sprayed by a religious group invaded private residences through the windows that were opened because of muggy weather, claiming the lives of peaceful residents and depriving people of rays of hope. The religious group, Aum Shinrikyo, planned to prevent a verdict in an action for vacation of its training hall at the Matsumoto branch office of Nagano District Court by releasing the highly poisonous gas near the living quarters of court judges. This extremely childish behavior resulted in mass casualties.

During this emergency event, the fire department, police, and all medical facilities in the city worked together closely. They were bewildered by the unfamiliar situation; from the symptoms and complaints of the victims, they suspected poisoning by an organic phosphorus gas, and treated the victims accordingly. The treatment was appropriate and minimized the harm, helping to deal with the subsequent Tokyo subway sarin attack by Aum Shinrikyo.

One week after the attack, when the causative substance had been identified, a liaison meeting by physicians who had treated the victims was held to confirm treatment courses and to discuss the necessity of continuous follow-up of the victims, continuous health surveys of the affected residents, and management of symptoms. Little information was available about the intermediate and long-term effects of sarin on the human body. In consideration of the necessary long-term health surveys of the victims and the importance of data preservation, the physicians formulated a policy to continue health surveys via questionnaires and medical checkups. Accordingly, we have executed the policy in cooperation with the Shinshu University Hospital.

However, over time, some victims relocated and others wish to forget the attack. Recently, no victims wanted to receive medical checkups. Thus, the completion of the 20-year health survey activities was put before the council and approved on condition that a medical checkup is carried out upon request of a victim and that the survey data is recorded and stored.

In closing, I hope that such a harrowing affair would not occur again anywhere in the world.

Message on the occasion of the publication

Akira Sugeno, MD, PhD, Mayor of Matsumoto City

Late at night on June 27, 1994, the sarin attack at Kitafukashi 1, Matsumoto City, took the lives of people in a moment, afflicted many residents, and caused a major shock to their mind. We cannot forgive the attack for eternity, which discounted the value of human life and human dignity. At the time, I was working at Shinshu University and the attack is burned into my memory forever.

We would like to mourn the eight people who lost their lives and to express profound sympathy for all the victims again.

We established the Headquarters of the Matsumoto City Poisoning Attack Countermeasures immediately after the attack, and implemented rapid and appropriate emergency measures, with the public administration and healthcare personnel working collaboratively from the start.

In particular, health surveys and medical checkups by the Matsumoto City Council of Community-Based Integrated Care have been implemented continuously for 20 years from immediately after the attack up to last year. We are deeply grateful to all personnel from the organizations involved, the physicians and professors of the Shinshu University Hospital and the Shinshu University School of Medicine, Nagano Prefecture, Matsumoto City Medical Association, and residents of the region, for their cooperation in implementing the health surveys and medical checkups.

This time, given the best effort by the Matsumoto City Council of Community-Based Integrated Care, we can publish a report summarizing the health survey activities of the past 20 years. The major contents of the report include results of the health surveys via a questionnaire for 10 years and the medical checkups for 20 years, along with a summary. This report will function as reference material for subsequent crisis management countermeasures against terrorism involving chemical weapons. We hope that the Matsumoto Sarin Attack will not be forgotten, but continue to be discussed and used as a lesson.

Since my appointment as mayor, I, who had engaged in medical care for a long time, have worked to create a city where residents respect human life and promote activities related to healthcare, crisis management, and support for child-rearing. I want the residents of Matsumoto to say, "This city is safe" and "It is good to live in this city"; as instituting measures to protect residents' lives and health are my highest priorities. I believe that it is my duty as a mayor. We would appreciate it if all related persons would continue to support us and cooperate with us.

I end my talk hoping that such a harmful event would not occur again.

3. Organizational system of victims' health surveys

3. Organizational system of victims' health surveys

Organizational chart
July 1994

Matsumoto City Council of Community-Based Integrated Care Advisor: Tadashi Aruga Chair: Shohei Mimura
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Special Committee on Medical Cares Against Toxic Gas Poisoning					
Matsumoto City Director of the City News Department Toshihiro Nanbara	Matsumoto Healthcare Center Head of the center Yoko Midorikawa	Shinshu University Hospital Director of the hospital Nobuo Yanagisawa	Matsumoto City Medical Association Chair Shohei Mimura	Matsumoto City Dental Association Chair Toru Kasahara	Matsumoto Pharmaceutical Association Chair Kenji Tatai

Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack	
Chair: Director of the Shinshu University Hospital	Nobuo Yanagisawa
Vice-Chair: Vice-chair of the Matsumoto City Medical Association	Sadayoshi Kubota
Head of the Matsumoto City Healthcare Center	Yoko Midorikawa
Professor of the Department of Public Health, Shinshu University School of Medicine	Nobuhiro Maruchi
Head of the Nagano Prefectural Cancer Detection and Emergency Care Center	Kiyohiko Hayashi
Director of the Emergency Department, Nagano Prefectural Cancer Detection and Emergency Care Center	Mikio Shimizu
Lecturer of the Department of Emergency and Critical Care, Shinshu University Hospital	Hiroshi Okudera
Assistant of the Third Department of Internal Medicine, Shinshu University School of Medicine	Hiroshi Morita
Chief of the National Health Insurance Medical Care Section, City News Department, Matsumoto City	Hiroko Otsuki
Chief of the Residents' Health Section, City News Department, Matsumoto City	Akiko Nakamura

Health Surveys Committee Chair: Yoko Midorikawa	Hospital/Clinic Liaison Conference Chair: Mikio Shimizu
Matsumoto Healthcare Center Shigeru Yanagisawa Third Department of Internal Medicine, Shinshu University School of Medicine Hiroshi Morita Department of Public Health, Shinshu University School of Medicine Tamie Nasu Residents' Health Section, City News Department, Matsumoto City Akiko Nakamura Matsumoto City Medical Association Kuniaki Matsuda Matsumoto City Medical Association Medical Center Shigeru Hayashi	Related hospitals Aizawa Hospital Hiroataka Kawakami Nagano Prefectural Cancer Detection and Emergency Care Center Hidemitsu Hirabayashi Shironishi Hospital Ken Seki Shinshu University Hospital: First Department of Internal Medicine Keishi Kubo Second Department of Internal Medicine Takeshi Sodeyama Third Department of Internal Medicine Hiroshi Morita Department of Ophthalmology Masahiko Nohara Department of Emergency and Critical Care Hiroshi Okudera Matsumoto Kyoritsu Hospital Jun Suzuki Marunouchi Hospital Shinobu Sato Related clinic Jinichiro Koshi
Secretariat	
Residents' Health Section, City News Department, Matsumoto City Mayumi Yajima Secretariat of Matsumoto City Medical Association Tetsuyoshi Nishihara	

Matsumoto City Council of Community-Based Integrated Care

Special Committee on Medical Cares Against Toxic Gas Poisoning					
Director of the City News Department, Matsumoto City	Head of Matsumoto Healthcare Center	Director of the Shinshu University Hospital	Chair of the Matsumoto City Medical Association	Chair of the Matsumoto City Dental Association	Chair of the Matsumoto Pharmaceutical Association

Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack
<p>Chair: Director of the Shinshu University Hospital</p> <p>Vice-Chair: Vice-chair of the Matsumoto City Medical Association</p> <p>Head of the Matsumoto Healthcare Center</p> <p>Professor of the Department of Pulic Health, Shinshu University School of Medicine</p> <p>Head of the Nagano Prefectural Cancer Detection and Emergency Care Center</p> <p>Director of the Emergency Department, Nagano Prefectural Cancer Detection and Emergency Care Center</p> <p>Lecturer of the Department of Emergency and Clitical Care, Shinshu University Hospital</p> <p>Assistant of the Third Department of Internal Medicine, Shinshu University School of Medicine</p> <p>Chief of the National Health Insurance Medical Care Section, City News Department, Matsumoto City</p> <p>Chief of the Residents' Health Section, City News Department, Matsumoto City</p>

Health Surveys Committee
Chair: Head of the Matsumoto Healthcare Center
<p>Matsumoto Healthcare Center</p> <p>Third Department of Internal Medicine, Shinshu University School of Medicine</p> <p>Department of Public Health, Shinshu University School of Medicine</p> <p>Residents' Health Section, City News Department, Matsumoto City</p> <p>Matsumoto City Medical Association</p> <p>Matsumoto City Medical Association Medical Center</p>

Secretariat
<p>Residents' Health Section, City News Department, Matsumoto City</p> <p>Secretariat of Matsumoto City Medical Association</p>

Matsumoto City Council of Community-Based Integrated Care

Health Surveys Committee
Chair: Head of the Matsumoto Healthcare Center
<p>Matsumoto Healthcare Center</p> <p>Third Department of Internal Medicine, Shinshu University School of Medicine</p> <p>Department of Public Health, Shinshu University School of Medicine</p> <p>Residents' Health Section, City News Department, Matsumoto City</p> <p>Matsumoto City Medical Association</p> <p>Matsumoto City Medical Association Medical Center</p>

Secretariat
<p>Residents' Health Section, City News Department, Matsumoto City</p> <p>Secretariat of the Matsumoto City Medical Association</p>

4. Detail on conducting the health surveys after the attack

4. Details of dealing with the health surveys after the attack

Held / Implemented date	Medical checkups etc.	Meetings, others	
1994			
June 28	Explanatory meeting for residents: Medical checkup recommendations and explanation of an aid fund for initial consultation fees	Matsumoto City Kaichi Health Center Establishment of the Headquarters of the Matsumoto City Poisoning Attack Countermeasures	Matsumoto City Hall
June 29	Start of health consultation and delivery of the aid fund for the initial consultation fee of outpatient medical expense		
June 30		Decided to set meetings where physicians in charge of treatment could collectively share their opinions and information; they initially communicated separately	
July 4		1st Liaison Meeting by Physicians in Charge of Actual Medical Care Physicians from medical facilities who directly examine patients affected by the attack gathered and exchanged information and treatment policies.	Nagano Prefectural Cancer Detection and Emergency Care Center
July 7		General Meeting of the Matsumoto City Council of Community-Based Integrated Care It was decided that the council take the lead in proceeding with future measures, such as understanding health conditions and collection, storage, and recording of information, etc.	Matsumoto Tokyu Inn
July 11		Meeting of Special Committee of the Matsumoto City Council of Community-Based Integrated Care (temporary name) Matsumoto City Medical Association, Matsumoto City, Matsumoto Healthcare Center, and Shinshu University School of Medicine discussed future measures and decided implementation of questionnaires and medical checkups for residents, as well as holding explanatory meetings for representatives of residents.	Matsumoto City Medical Association
July 12	Designing/printing of questionnaire sheets		
July 14	Explanatory meeting for heads of neighborhood associations, etc. The Headquarters of the Matsumoto City Poisoning Attack Countermeasures distributed the 1st questionnaire sheets and explained the implementation of a medical checkup.	Matsumoto City Kaichi Health Center	
July 15		Aid fund was delivered by the Nagano Prefectural Clinical Forensic Pathology Association.	
July 17	Collection of the 1st questionnaire sheets.		

Held / Implemented date	Medical checkups etc.		Meetings, others	
July 19	Notification of the medical checkup schedule to residents desiring the 1st medical checkup.		2nd Liaison Meeting by Physicians in Charge of Actual Medical Care Exchange of information about subsequent patient conditions Requested the establishing of a expert committee on medical care within the Council of Community-Based Integrated Care; confirmed the continuation of affairs as a singular department	Nagano Prefectural Cancer Detection and Emergency Care Center
July 23-24	Implementation of the 1st medical checkup.	Matsumoto City Kaichi Health Center		
August 3	Circulate among residents the health consultation recommendations and the aid fund for hospitalization medical expenses		The 1st primary meeting for toxic gas poisoning attack It was decided to establish the Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack, as well as the Health Surveys Committee and Hospital/Clinic Liaison Conference under the jurisdiction of the expert committee.	Matsumoto City Medical Association
August 4	Checking of patient names treated at medical facilities			
August 10	Start of delivery of the aid fund for hospitalization medical expenses			
August 15	Mailing the results of the 1st medical checkup			
August 19-25	Implementation of a red blood cell cholinesterase test 184 persons who had been treated at medical facilities but had not received medical checkups were invited for test. The test was conducted in 76 persons who requested it.	Matsumoto City Medical Association Medical Center		
August 25			The 1st meeting of Health Surveys Committee Discussion regarding analysis of medical checkup and questionnaire results, future measures, and budget collection.	Matsumoto Healthcare Center
August 29			Primary meeting for explanation to residents Discussion about explanation to residents (medical checkup and questionnaire results, response to the press, and notification to related persons) and future measures (meetings of expert committee and special committee)	Matsumoto City Medical Association
August 31	Explanatory meeting for residents Explanation regarding the results of the 1st medical check and questionnaires	Matsumoto City Kaichi Health Center		
September 3			Distribution of "clinical survey sheets about the toxic gas attack" by the Hospital/Clinic Liaison Conference to associated hospitals	

Held / Implemented date	Medical checkups etc.		Meetings, others	
September 14	<p>Sending of notifications to residents with low red blood cell true cholinesterase level regarding recommendation to hematological examinations.</p> <p>Notifications were mailed by city government to 13 persons with low level in the July medical checkup, and by associated hospitals to 6 persons with low level in the August medical checkup.</p>			
September 21			<p>The 1st meeting of the Hospital/Clinic Liaison Conference.</p> <p>Discussion regarding course of investigation requests to associated hospitals and patient follow-up</p>	Matsumoto City Medical Association
September 29–30	<p>Re-examination of residents with low red blood cell true cholinesterase level (2nd examination)</p> <p>Among 25 persons with low level, 13 persons underwent blood collection.</p>	Matsumoto City Medical Association Medical Center		
October 18			<p>Clerical primary meeting</p> <p>Budget primary meeting between the Matsumoto Healthcare Center, Matsumoto City Government, and Matsumoto City Medical Association</p>	Matsumoto City Medical Association
October 20	<p>Mailing of the 2nd questionnaire sheets.</p> <p>City government mailed the results of the hematological examinations conducted on September 29-30 to the patients.</p>			
October 24–November 2	<p>Home visits</p> <p>Implemented for persons who responded "I cannot work" in the 1st questionnaire.</p>			
November 15			<p>The 1st meeting of the Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack</p> <p>Discussion about subsequent course, examination results and questionnaire situation by Health Surveys Committee, investigation situation by Hospital/Clinic Liaison Conference, and the written budget (draft).</p>	Matsumoto City Medical Association
December 6			<p>Sending of request letters and examples to physicians in charge at each hospital regarding case reports</p>	
December 20			<p>The 2nd meeting of the Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack</p> <p>Discussion about investigation situation by Health Surveys Committee, investigation situation by Hospital/Clinic Liaison Conference, the written budget (draft), and making reports, etc.</p>	Matsumoto City Medical Association

Held / Implemented date	Medical checkups etc.	Meetings, others
1995		
February 13		The 3rd meeting of the Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack Discussion regarding making reports and the written budget (draft). Matsumoto City Medical Association
March 24	Circulating the results of the health questionnaires (1st and 2nd) and medical checkups to residents of 9 neighborhood associations	
April 10		Joint meeting of the Special Committee and Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack Discussion regarding the printing of investigation reports (5,000 copies), debrief session to the press, and special service meetings Debrief session to the press Matsumoto City Medical Association
April 18		Distributing investigation reports to related institutions
May 9		Joint meeting of the Special Committee and Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack Discussion regarding publication of investigation reports and the balance of payments Matsumoto Tokyu Inn
June 2		The 2nd meeting of the Health Surveys Committee Discussion about the handling of the first year health surveys and investigation reports Matsumoto City Medical Association
June 19		The 2nd meeting of the Hospital/Clinic Liaison Conference Discussion about handling of the first year health surveys and investigation reports Matsumoto City Medical Association
June 23–30	Distribution and collection of the 3rd questionnaire sheets through heads of neighborhood associations (mailed to residents outside the afflicted area)	
July 5	Notification of the medical checkup schedule to residents desiring the 3rd medical checkup.	
July 17–19	Implementation of the 3rd medical checkup	Shinshu University Hospital
August 6	Mailing of the results of the 3rd medical checkup	
August 21		General meeting of the Matsumoto City Council of Community-Based Integrated Care Discussion regarding reports on progress of medical care against toxic gas poisoning; report on the balance of payments Matsumoto Tokyu Inn

Held / Implemented date	Medical checkups etc.		Meetings, others	
1996				
January 16			Joint meeting of the Special Committee and Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack Discussion about the results of the first year medical checkup and questionnaire, future measures, and report on the balance of payments	Matsumoto Hotel Kagetsu
February 9	Circulating the results of the 3rd health survey to residents through heads of neighborhood associations Mailing of the 4th questionnaire sheets			
February 29– March 1	Implementation of the 4th medical checkup	Shinshu University Hospital		
March 28	Mailing of the results of the 4th medical checkup			
May 9			Joint meeting among the chair, vice-chair, and other chairs of the Special Committee and Expert Committee on Medical Cares Against Toxic Gas Poisoning Attack Discussion about handling donated money, dismissal of the Special Committee and the Expert Committee, and handling investigation reports	Matsumoto City Medical Association
June 24			The 3rd meeting of the Health Surveys Committee Discussion about the results of the 4th health survey and implementation of health surveys, etc. two years later.	Matsumoto City Medical Association
June 27			Enacting the Ordinance of Fund for the Health Management of Victims of the Matsumoto Sarin Attack etc. General meeting of the Matsumoto City Council of Community-Based Integrated Care Discussion regarding reports on progress of medical care against toxic gas poisoning; report on the balance of payments related to the toxic gas poisoning	Miyoshi
November 1			Receiving the Japan Medical Association Supreme Award of Merit For playing a major role in responding to the Matsumoto Sarin Attack	Japan Medical Association
November 28			The 4th meeting of the Health Surveys Committee Reporting the progress and discussing the 5th health survey	Matsumoto City Medical Association

Held / Implemented date	Medical checkups etc.		Meetings, others	
November 29			Meeting of the Matsumoto City Council of Community-Based Integrated Care and the Expert Committee Reporting the receiving the Japan Medical Association Supreme Award of Merit Discussion about subsequent medical checkups	Matsumoto Tokyu Inn
1997				
February 24	Circulating the results of the 4th health survey to residents through heads of neighborhood associations Distribution and collection of the 5th questionnaire sheets through heads of neighborhood associations (mailed to residents outside the afflicted area)			
March 3	Notification of the medical checkup schedule to residents desiring the 5th medical checkup			
March 13–14	Implementation of the 5th medical checkup	Shinshu University Hospital		
April 10	Mailing of the results of the 5th medical checkup			
June 18			The 5th meeting of the Health Surveys Committee Discussion about the results of the questionnaires and medical checkups	Matsumoto City Medical Association
June 19			General meeting of the Matsumoto City Council of Community-Based Integrated Care Discussion regarding reports on progress of medical care against toxic gas poisoning; report on the balance of payments related to the toxic gas poisoning	Matsumoto Tokyu Inn
July 15	Circulating the results of the 5th medical checkup to residents through heads of neighborhood associations			
1998				
February 3			The 6th meeting of the Health Surveys Committee Discussion about the questionnaire and medical checkups	Matsumoto City Medical Association
February 17	Mailing of the 6th questionnaire sheets			
March 2	Notification of the medical checkup schedule to residents desiring the 6th medical checkup			
March 19	Implementation of the 6th medical checkup	Shinshu University Hospital		
April 10	Mailing of the results of the 6th medical checkup			

Held / Implemented date	Medical checkups etc.		Meetings, others	
June 30			The 7th meeting of the Health Surveys Committee Discussion about the questionnaires, results of the medical checkups, and changing of the committee member	Matsumoto City Medical Association
July 2			General meeting of the Matsumoto City Council of Community-Based Integrated Care Discussion regarding reports on progress of medical care against toxic gas poisoning; report on the balance of payments related to the toxic gas poisoning	Matsumoto Tokyu Inn
1999				
January 26			The 8th meeting of the Health Surveys Committee Discussion about implementation of the questionnaires and medical checkups	Matsumoto City Medical Association
February 12	Mailing of the 7th questionnaire sheets			
February 26	Notification of the medical checkup schedule to residents desiring the 7th medical checkup			
March 11–12	Implementation of the 7th medical checkup	Shinshu University Hospital		
April 9	Mailing of the results of the 7th medical checkup Mailing of survey sheets to residents who desired psychosomatic medicine consultation (suspected PTSD)			
May 24			The 9th meeting of the Health Surveys Committee Discussion about the questionnaires, medical checkups, and a summary of the survey reports; reported regarding the balance of payment	Matsumoto City Medical Association
June 16	Implementation of the 8th medical checkup	Shinshu University Hospital		
June 27	Cooperating in holding concerts for supporting the victims and symposiums Organizer: Mutual Aid Fund for Victims of Sarin Attack	Matsumoto City Sociocultural Hall		
July 17			The 10th meeting of the Health Surveys Committee Discussion regarding the reports by the Health Surveys Committee, summary of the investigation reports, future measures, subjects and reports presented to the Council of Community-Based Integrated Care	Matsumoto Green Hotel

Held / Implemented date	Medical checkups etc.		Meetings, others	
July 19			General meeting of the Matsumoto City Council of Community-Based Integrated Care Discussion about reports on implementing the health surveys for residents poisoned by toxic gas, handling of non-payment for the health survey expense, future measures, and list of the Health Surveys Committee members (draft)	Matsumoto City Medical Association
August 25	Implementation of psychosomatic medicine consultations	Shinshu University Hospital		
December 21			The 11th meeting of the Health Surveys Committee Discussion about the results of the medical checkups, future measures, and summary of the investigation reports	Matsumoto City Medical Association
2000				
February 8			The 12th meeting of the Health Surveys Committee Discussion about the summary of the investigation reports	Matsumoto City Medical Association
June 5			The 13th meeting of the Health Surveys Committee Discussion about the investigation reports, the Council of Community-Based Integrated Care, and forums	Matsumoto City Medical Association
June 19			General meeting of the Matsumoto City Council of Community-Based Integrated Care After discussion about the health surveys regarding the toxic gas poisoning, holding a ceremony for the publication of "Health crisis management system in Matsumoto city" (1,400 copies)	Matsumoto Tokyu Inn
August 18			The 14th meeting of the Health Surveys Committee Discussion about holding a forum titled "Considering the Response to Citizens' Health Crisis"(draft)	Matsumoto City Medical Association
October 7	Holding of a public lecture "Considering the Response to Citizens' Health Crisis"	Nagano Prefectural Matsumoto Culture Hall		
2001				
February 8-20	Implementation of the 9th questionnaire			
February 19	Implementation of the 9th medical checkup	Outside Nagano Prefecture (Tokyo)		
March 9	Implementation of the 9th medical checkup (internal medicine, ophthalmology, and mental counseling)	Shinshu University Hospital		

Held / Implemented date	Medical checkups etc.		Meetings, others	
June 27			General meeting of the Matsumoto City Council of Community-Based Integrated Care Reporting the results of the medical checkups for residents poisoned by toxic gas	Matsumoto Tokyu Inn
2002				
January 17-31	Implementation of the 10th questionnaire			
August 20			General meeting of the Matsumoto City Council of Community-Based Integrated Care No individual desiring a medical checkup in FY2001 (report)	Matsumoto Tokyu Inn
2003				
January 14-February 3	Implementation of 11th questionnaire			
March 14	Implementation of the 11th medical checkup (internal medicine)	Shinshu University Hospital		
April 11	Implementation of the 11th medical checkup (ophthalmology)	Shinshu University Hospital		
July 15			General meeting of the Matsumoto City Council of Community-Based Integrated Care Reporting the medical checkups for residents poisoned by toxic gas	Matsumoto Tokyu Inn
September 25			Round table discussion about the medical checkups for residents poisoned by toxic gas, etc.	Matsumoto City Medical Association
November 25-December 3	Implementation of the 12th questionnaire			
2004				
February 12	Implementation of the 12th medical checkup (ophthalmology/neurology)	Shinshu University Hospital Outside Nagano Prefecture (Osaka)		
April 30			Investigational Meeting of the Results of the Health Surveys and Medical Checkups for the Victims of the Matsumoto Sarin Attack Discussion about the results of the questionnaires and the medical checkups, and future measures Press conference	Matsumoto City Medical Association
May 15	Circulating the results of the 12th questionnaires to residents			

Held / Implemented date	Medical checkups etc.		Meetings, others	
June 22			General meeting of the Matsumoto City Council of Community-Based Integrated Care Discussion about matters related to medical checkups for residents poisoned by toxic gas and decision to cease questionnaires	Matsumoto Tokyu Inn
June 26	Public lecture regarding health crisis management "Again Learning Importance of Lives 10 years after the Matsumoto Sarin Attack"	M-Wing (Matsumoto City Community Center)		
2005				
June 28			General meeting of the Matsumoto City Council of Community-Based Integrated Care Matters related to medical care against the toxic gas poisoning: implementation of additional medical checkups for residents desiring the medical checkup was approved in the project plan.	Matsumoto Tokyu Inn
2006				
February 16	Implementation of the 13th medical checkup (ophthalmology/neurology) Implemented in one person among two persons who desired it.	Shinshu University Hospital		
June 27			Meeting of the Matsumoto City Council of Community-Based Integrated Care Report on the medical checkups conducted in February 2006	Matsumoto City Medical Association
2007				
March 27	Implementation of the 14th medical checkup (psychiatry, neurology, and cranial nerve neurology) Implemented in one person who desired it	Shinshu University Hospital		
June 27			General meeting of the Matsumoto City Council of Community-Based Integrated Care Reporting the medical checkup conducted in March 2007	Matsumoto City Medical Association
2008				
January 17	Implementation of the 15th medical checkup (ophthalmology) Implemented in two persons who desired it	Shinshu University Hospital		
February 18	Implementation of the 15th medical checkup (cranial nerve neurology) Implemented in one person who desired it	Shinshu University Hospital		

Held / Implemented date	Medical checkups etc.		Meetings, others	
September 30			General meeting of the Matsumoto City Council of Community-Based Integrated Care Reporting the medical checkups conducted in January and February 2008	Matsumoto City Medical Association
2009				
February 5	Implementation of the 16th medical checkup (ophthalmology/neurology) Implemented in two persons who desired it	Shinshu University Hospital		
May 27			General meeting of the Matsumoto City Council of Community-Based Integrated Care Reporting the medical checkup conducted in February 2009	Matsumoto City Medical Association
2010				
July 12			General meeting of the Matsumoto City Council of Community-Based Integrated Care No individuals desiring a medical checkup in FY2009 (report)	Matsumoto City Medical Association
2011				
March 3	Implementation of the 18th medical checkup (ophthalmology/neurology) Implemented in one person who desired it	Shinshu University Hospital		
May 23			General meeting of the Matsumoto City Council of Community-Based Integrated Care Reporting the medical checkup conducted in March 2011	Matsumoto City Medical Association
2012				
May 31			General meeting of the Matsumoto City Council of Community-Based Integrated Care No individuals desiring a medical checkup in FY2011 (report)	Matsumoto City Medical Association
2013				
August 1			General meeting of the Matsumoto City Council of Community-Based Integrated Care No individuals desiring a medical checkup in FY 2012 (report) A decision was made to complete council activity on condition that a medical checkup is carried out upon request of a residents in the future.	Matsumoto City Medical Association

Held / Implemented date	Medical checkups etc.		Meetings, others	
2014				
July 15			General meeting of the Matsumoto City Council of Community-Based Integrated Care A decision was made to produce data reports after the publication of previous reports	Matsumoto City Medical Association
August 6	Implementation of the 22nd medical checkup (one person)	Shinshu University Hospital		
2015				
July 15			General meeting of the Matsumoto City Council of Community-Based Integrated Care Reporting the medical checkup conducted in August 2014	Matsumoto City Medical Association

5. Victim health survey activities

(1) Implementation progress of the health surveys/medical checkups

(2) Progress of health survey activities via questionnaires

- Details from the 1st to the 12th questionnaire
- Health follow-up of victims with sarin poisoning in the 10th year

Tamie Nasu

3) Health survey activities by medical checkups

- Content/situation and the results of the 1st to the 22nd medical checkup
- Summary of 20-year medical checkups

Hiroshi Morita

5. Victim health survey activities

*<Evaluation>

A: No abnormality associated with poisoning

B: Although abnormalities in the evaluations and examinations were present, association with poisoning was low.

C: Abnormalities that may be associated with poisoning were

(1) Implementation progress of the health surveys/medical checkups

Times of activities	Fiscal year	Questionnaire				Medical checkup											
		Month of implementation	Subjects	Number of the collection	Presence of subjective symptoms (Actual)	Date of implementation	Time after the attack	Number of persons who desired it	Persons who presented at medical facilities	*Evaluation							
										A	B	C	Unknown				
The 1st	1994	July, 1994	2,052	1,743	129	June 23 and 24, 1994	3 weeks later	150	155	96 Mild abnormalities: 59 persons							
The 2nd	1994	October - November, 1994	266	160	55	September 29 and 30, 1994	3 months later	45	13	13	0	0					
The 3rd	1995	June, 1995	2,052	1,237	58	July 17, 18, and 19, 1995	1 year later	154	72	49	18	5					
The 4th	1995	February, 1996	108	75	40	February 29 and March 1, 1996	1.8 years later	121	29	15	9	5					
The 5th	1996	February, 1997	2,000	836	46	March 13 and 14, 1997	2.8 years later	87	31	25	3	3					
The 6th	1997	February - March, 1998	66	33	23	March 19, 1998	3.8 years later	15	10	6	1	3					
The 7th	1998	February - March, 1999	387	175	23	March 11 and 12, 1999	4.8 years later	17	15	8	1	6					
The 8th	1999	/				June 16, 1999	5.0 years later	10	2	1	0	1					
The 9th	2000					February, 2001	32	19	7	February 19 and March 9, 2001	6.7 years later	10	7	4	0	2	Outside the prefecture 1
The 10th	2001					January, 2002	6	3	0	Planning in March, 2002	7.8 years later	None	0	-	-	-	
The 11th	2002					January - February, 2003	9	9	7	March 14 and April 11, 2003	8.8 years later	7	7	5	0	2	
The 12th	2003					November - December, 2003	1,813	727	99	February 12, 2004	9.7 years later	21	18	12	4	1	Outside the prefecture 1
The 13th	2005					/				February 16, 2006	11.7 years later	2	1	1	0	0	
The 14th	2006									March 27, 2007	12.8 years later	1	1	1	0	0	
The 15th	2007									January 17 and February 18, 2008	13.7 years later	2	2	1	0	1	
The 16th	2008									February 5, 2009	14.7 years later	2	2	1	0	1	
The 17th	2009									Planning in March, 2010	None	0	-	-	-		
The 18th	2010									March 3, 2011	17.8 years later	1	1	1	0	0	
The 19th	2011									Planning in March, 2012	None	0	-	-	-		
The 20th	2012									Planning in March, 2013	None	0	-	-	-		
The 21st	2013	Planning in March, 2014	None	0	-					-	-						
The 22nd	2014	August 6, 2014	20.1 years later	1	1					0	0	1					
Total number of subjects			8,791		Total number of subjects					646							
Total number of persons who receive questionnaire			5,017		Total number of persons who had checkups					367							
					Actual number of persons who had checkups					244							

(2) Progress of health survey activities via questionnaires

[1st questionnaire: July 1994, three weeks after the attack]

Implementation period: July 14–17

Subject districts: three local districts (Tamachi, Shintamachi, Okachimachi), 435 households; six neighborhood associations (Nishimachi, Doumachi, Koubarimachi, Doushinmachi, Aramachi, Yasuharacho), 567 households. Total: 1,002 households in nine districts

Total distribution number: 1,002 households, 2,052 persons

Total collection number: 1,743 persons (collection rate: 84.9%)

Presence of subjective symptoms: 129 persons

Regarding detailed results, please refer to “Report on surveys of the toxic gas poisoning in Matsumoto City” published in March 1995 (page 110–; the results and analyses of the 1st and the 2nd surveys)

[2nd questionnaire: October–November 1994, three–four months after the attack]

Implementation period: October 20–November 15

Subjects: Persons who had subjective symptoms in the 1st health survey conducted in July, as well as those who visited medical facilities and had unknown courses of the symptoms, etc.

Number of persons mailed: 266

Total collection number: 160 persons (collection rate: 60.2%)

Presence of subjective symptoms: 55 persons

Regarding detailed results, please refer to “Report on surveys of the toxic gas poisoning in Matsumoto City” published in March 1995 (page 110–; the results and analyses of the 1st and the 2nd surveys)

[3rd questionnaire: June 1995, one year after the attack]

Implementation period: June 23–30

Subjects: Distributed through the heads of neighborhood associations to primarily local districts.

Mailed to residents outside the afflicted areas.

Number of persons distributed and mailed: 2,052

Total collection number: 1,237 persons (collection rate: 60.3%)

Presence of subjective symptoms: 58 persons

Regarding detailed results, please refer to “Health crisis management system in Matsumoto City” published in March 2000 (page 52–61; the health survey report, the 3rd survey).

[4th questionnaire: February 1996, one year and seven months after the attack]

Implementation period: February 9–17

Subjects: Persons who had persisting subjective symptoms in the health survey

conducted one year later

Number of persons mailed: 108

Total collection number: 75 persons (collection rate: 64.9%)

Presence of subjective symptoms: 40 persons

Regarding detailed results, please refer to “Health crisis management system in Matsumoto City” published in March 2000 (page 62–65; the health survey report, the 4th survey)

[5th questionnaire: February 1997, two years and seven months after the attack]

Implementation period: February 24–March 3

Subjects: All the residents in subject areas in order to clarify whether their subjective symptoms seen at two to three years after sarin exposure were subsequent complications of sarin poisoning

Subject areas: three local districts (Tamachi, Shintamachi, Okachimachi); six neighborhood associations (Nishimachi, Doumachi, Koubarimachi, Doushinmachi, Aramachi, Yasuharacho). Total: nine districts

Number of persons distributed: 2,000 (mailed to individuals who had left their previously recorded addresses)

Total collection number: 836 persons (collection rate: 41.8%)

Presence of subjective symptoms: 46 persons

Regarding detailed results, please refer to “Health crisis management system in Matsumoto City” published in March 2000 (page 66–69; the health survey report, the 5th survey).

[6th questionnaire: February–March 1998, three years and seven months after the attack]

Implementation period: February 17–March 2

Subjects: Persons who had persisting subjective symptoms in the 5th health survey

Number of persons mailed: 66

Total collection number: 33 persons (collection rate: 50.0%)

Presence of subjective symptoms: 23 persons

Regarding detailed results, please refer to “Health crisis management system in Matsumoto City” published in March 2000 (page 70; the health survey report, the 6th survey).

[7th questionnaire: February–March 1999, four years and seven months after the attack]

Implementation period: February 12–March 1

Subjects: Persons who consulted with medical facilities immediately after the occurrence of sarin poisoning

Number of persons mailed: 387

Total collection number: 175 persons (collection rate: 45.2%)

Presence of subjective symptoms: 23 persons

Regarding detailed results, please refer to “Health crisis management system in

Matsumoto City” published in March 2000 (page 71–82; the health survey report, the 7th survey).

[8th questionnaire: Not implemented]

[9th questionnaire: February 2001, six years and seven months after the attack]

Implementation period: February 8–20

Subjects: Persons who had persisting subjective symptoms in the 7th health survey

Number of persons mailed: 32

Total collection number: 19 persons (collection rate: 59.4%)

Presence of subjective symptoms: 7 persons

[10th questionnaire: January 2002, seven years and six months after the attack]

Implementation period: January 17–31

Subjects: Persons who were consulted in the 9th medical checkup

Number of persons mailed: 6

Total collection number: 3 persons (collection rate: 50.0%)

Presence of subjective symptoms: None

[11th questionnaire: January–February 2003, eight years and seven months after the attack]

Implementation period: January 14–February 3

Subjects: Persons who experienced aftereffects

Number of persons mailed: 9

Total collection number: 9 persons (collection rate: 100.0%)

Presence of subjective symptoms: 7 persons

[12th questionnaire: November–December 2003, nine years and six months after the attack]

Implementation period: November 25–December 3

Subjects: All the afflicted residents in the subject areas in order to clarify whether subsequent complications of sarin poisoning remained ten years after exposure

Subject areas: three local districts (Tamachi, Shintamachi, Okachimachi); six neighborhood associations (Nishimachi, Doumachi, Koubarimachi, Doushinmachi, Aramachi, Yasuharacho). Total: nine districts

Victims who had left the city with known new addresses

Staff of the Matsumoto Regional Fire Bureau

Number of persons distributed: 1,813

Total collection number: 727 persons (collection rate: 40.1%)

Total number of valid responses: 668 persons

Presence of subjective symptoms at the time of the attack: 99 persons (actual

number of the persons)

- Physical fatigue 55 persons (following numbers are the total numbers)
- Getting tired easily 49 persons
- Susceptibility to cold 35 persons
- Sudden racing pulse 24 persons
- Easily fatigued in the eyes 67 persons
- Clouded vision 49 persons
- Flashbacks to the attack 35 persons
- Having nightmares 20 persons

The decision was made to end the questionnaires at the general meeting of the Matsumoto City Matsumoto City Council of Community-Based Integrated Care held in FY2004, ten year after the attack.

Health Follow-up of victims with sarin poisoning in the 10th year

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Introduction

Sarin (CAS108-44-8) is a chemical weapon with a molecular weight of 140.09 and is present in the form of an extremely volatile colorless liquid at 2.5 mmHg (25°C) of steam pressure. In response to the sarin attack in Matsumoto City on June 27, 1994, the Matsumoto City Council of Community-Based Integrated Care established the Expert Committee on Medical Cares Against Toxic Gas Poisoning (Note 1) at the general meeting of July 7. In addition, the Health Surveys Committee and Hospital/Clinic Liaison Conference were established, and it was decided that health surveys were to be conducted in all affected areas and that inpatient and outpatient status were to be investigated primarily using hospital medical records.

The first health survey was initiated on July 14 of that year, and subsequently, medical checkups were conducted for persons who desired it. This health survey was conducted among 2,000 residents in whom all victims of sarin poisoning were assumed to be included, as well as among 52 staff members of the Matsumoto Regional Fire Bureau who delivered emergency rescue services. The same survey method was repeated ten times, the results of which have been already summarized in reports and papers, etc. ^{1, 2)}.

The summary of the survey results is presented below.

1) The number of sarin poisoning victims was about 600, among whom eight persons died (as of August 1, 2015).

2) The peak time at which the victims experienced subjective symptoms was 23–24 o'clock on June 27. An additional smaller spike was observed at 6–8 o'clock in the morning of the following day. This mainly consisted of victims with relatively milder subjective symptoms.

3) Among the victims, the subjective symptoms that were frequently observed in inpatients with severe symptoms were ocular symptoms such as “darkened vision,” “cloudy vision,” “narrowed visual field,” and “pain in the eyes.” Other frequent complaints included respiratory symptoms such as shortness of breath, as well as headache. Nasal mucosal irritation symptoms such as runny nose were seen frequently in outpatients regardless of the severity and in victims who were slightly affected (waiting at home).

4) Sarin poisoning victims included those living in an area extending about 800 m to the north and south and 570 m to the east and west from the place where 12 L sarin was released. Victims also included individuals passing by this area, bystanders, and eight staff members of the Matsumoto Regional Fire Bureau who were in the affected area to save affected residents.

5) Many of the victims were residents in an elliptical area extending 200 m to the northeast from the sarin release location.

6) Medical checkups were conducted in persons who desired it 1 month after the attack. The pupils of victims were smaller than those of unaffected individuals, and true/pseudo cholinesterase activity values were also lower.

7) The follow-up health surveys conducted for three to five years revealed that victims experienced aftereffects (body fatigue, feeling of helplessness, eye fatigue, among others). These symptoms were observed in many individuals who lived near the epicenter of the sarin attack, as well as those who were severely affected.

8) Surveys conducted five years after the attack showed that many victims had mental complaints.

Based on these results, the Matsumoto City Council of Community-Based Integrated Care conducted an additional survey during November–December 2003 using the same questionnaire as that used in the first survey. Regarding the detail of the questionnaire, please refer to the separate sheet.

Survey methods

The 11th health survey was conducted between November 25 (Tuesday) and December 3 (Wednesday) to clarify the aftereffects in sarin poisoning victims 10 years after the attack. The surveyed individuals were 1,291 residents of seven neighborhood associations of the Johoku District, 485 residents of Yasuhara District, 24 individuals who had left the affected region (severe victims only), and 13 staff members of the Matsumoto Regional Fire Bureau, for a total of 1,813 individuals. Table 1 shows the collection rate in each area. The consent for the survey by subjects was confirmed in the questionnaire sheet.

Table 1. Subjects for the survey

Subject district	Distributed	Collected	Collection rate (%)
Johoku District	1,291	527	40.8
Yasuhara District	485	182	37.5
Contacted by mail	24	6	25
Regional Fire Bureau staff	13	12	92.3
Total	1,813	727	40.1
Males / females	880/933	330/367	37.5/39.3
		(Unknown: 30)	

Among the 727 collected responses, 668 persons agreed to participate in the survey. These 668 effective responders and their responses were used for further analysis.

Results

1. Health conditions of sarin poisoning victims

The survey asked whether subjective symptoms were felt at the time of the sarin attack. Of responding individuals, 511 presented an answer, with 157 presenting no answer (Table 2).

Table 2 . Features of the health condition responders

Sarin-poisoned			
persons	Males	Females	Total
Respondents	39	60	99
Mean age (years)	54.1	62.1	58.9
Standard deviation	15.8	15.9	16.3
Non-sarin-poisoned			
persons	Males	Females	Total
Respondents	196	216	412
Mean age (years)	63.2	63.0	63.1
Standard deviation	18.8	16.6	17.7

The 511 respondents were divided into sarin-poisoned and non-sarin-poisoned persons, and responses regarding subjective symptoms were analyzed individually (Table 3). Subjective symptoms for health were classified into three types: 1) subjective symptoms where although there was no difference in symptom severity, the odds ratio of sarin-poisoned persons was high, 2) subjective symptoms where only in the case of severe subjective symptoms, the odds ratio was higher in sarin-poisoned persons, and 3) subjective symptoms occurring in many sarin-poisoned persons with increasing odds ratio with increasing severity. Subjective symptoms classified under 1) were physical fatigue, sudden racing pulse, nausea, dizziness, headache, discomfort in the eyes, sleeplessness among others, as well as mental symptoms such as a sense of physical tension and unintended flashbacks. Symptoms classified under 2) were susceptibility to a cold or diarrhea among others, which manifested as subjective symptoms only in sarin victims with severe symptoms. Subjective symptoms classified under 3) were physical fatigue, ocular symptoms such as ocular fatigue, as well as mental conditions such as having nightmares, which were observed frequently in sarin poisoning victims. It was also noted that the odds ratio for symptoms in this group increased in accordance with symptom severity.

Table 3. Subjective symptoms in sarin-poisoned and non-sarin-poisoned persons (all respondents)

Question	* Symptom severity	Poisoned persons	Non-poisoned persons	χ^2 test	** Odds ratio	95% confidence interval
4-1. Physical fatigue	0	38	202	0.0004		
	1-2	42	85		2.63	(1.58–4.36)
	3-4	7	14		2.66	(1.01–7.02)
4-2. Getting tired easily	0	32	187	0.0000		
	1-2	39	95		2.40	(1.41–4.07)
	3-4	16	21		4.45	(2.10–9.43)
4-3. Susceptibility to cold	0	49	219	0.0358		
	1-2	26	69		1.68	(0.97–2.91)
	3-4	9	16		2.51	(1.05–6.02)
4-4. Ease of developing low fever	0	67	266	0.0641		
	1-2	13	26		1.99	(0.97–4.07)
	3-4	4	6		2.65	(0.73–9.65)
4-5. Difficulty breathing	0	64	262	0.1831		
	1-2	12	28		1.75	(0.85–3.64)
	3-4	4	8		2.05	(0.60–7.01)
4-6. Chest tightening	0	65	258	0.2439		
	1-2	15	34		1.75	(0.90–3.41)
	3-4	2	6		1.32	(0.26–6.71)
4-7. Sudden racing pulse	0	58	249	0.0290		
	1-2	20	46		1.87	(1.03–3.39)
	3-4	4	5		3.43	(0.89–13.19)
4-8. Nausea	0	71	275	0.0806		
	1-2	11	18		2.37	(1.07–5.24)
	3-4	0	1			
4-9. Susceptibility to diarrhea	0	67	256	0.0277		
	1-2	10	38		1.01	(0.48–2.12)
	3-4	6	5		4.59	(1.36–15.48)
4-10. Stomachache	0	67	252	0.0620		
	1-2	12	26		1.74	(0.83–3.62)
	3-4	2	1		7.52	(0.67–84.22)
4-11. Decreased appetite	0	70	243	0.6147		
	1-2	9	35		0.89	(0.41–1.95)
	3-4	1	1		3.47	(0.21–56.21)

4-12. Dizziness	0	54	232	0.0019		
	1-2	25	40		2.69	(1.50–4.80)
	3-4	3	5		2.58	(0.60–11.12)
4-13. Headache	0	46	214	0.0009		
	1-2	28	50		2.61	(1.49–4.57)
	3-4	5	7		3.32	(1.01–10.93)
4-14. Easily fatigued in the eyes	0	18	156	0.0000		
	1-2	47	99		4.11	(2.26–7.49)
	3-4	20	24		7.22	(3.35–15.57)
4-15. Clouded vision	0	32	178	0.0002		
	1-2	37	81		2.54	(1.48–4.37)
	3-4	12	17		3.93	(1.71–9.00)
4-16. Near-sightedness	0	37	176	0.0081		
	1-2	30	82		1.74	(1.01–3.01)
	3-4	11	16		3.27	(1.40–7.62)
4-17. Far-sightedness	0	41	177	0.1843		
	1-2	27	75		1.55	(0.89–2.71)
	3-4	9	22		1.77	(0.76–4.12)
4-18. Loss of ocular focus	0	44	197	0.0155		
	1-2	27	70		1.73	(1.00–3.00)
	3-4	6	7		3.84	(1.23–11.98)
4-19. Ocular discharge	0	57	234	0.0023		
	1-2	19	39		2.00	(1.08–3.72)
	3-4	5	3		6.84	(1.59–29.47)
4-20. Ocular sensation of a foreign body	0	57	245	0.0003		
	1-2	20	26		3.31	(1.73–6.34)
	3-4	4	5		3.44	(0.89–13.21)
4-21. Others	0	9	36	0.0037		
	1-2	4	1		16.00	(1.59–161.16)
	3-4	0	0			
4-22. Sleeplessness	0	44	212	0.0006		
	1-2	32	55		2.80	(1.63–4.83)
	3-4	5	11		2.19	(0.72–6.62)
4-23. Having nightmares	0	62	247	0.0008		
	1-2	16	30		2.12	(1.09–4.14)
	3-4	4	1		15.94	(1.75–145.11)
4-24. Flashbacks to the sarin attack	0	47	244	0.0000		
	1-2	30	33		4.72	(2.63–8.47)
	3-4	5	1		25.96	(2.96–227.25)

4-25. Fear when approaching the sarin attack site.	0	54	241	0.0001		
	1-2	22	34		2.89	(1.57–5.33)
	3-4	5	4		5.58	(1.45–21.47)
4-26. Strong fear	0	73	261	0.1240		
	1-2	5	15		1.19	(0.42–3.39)
	3-4	3	2		5.36	(0.88–32.70)
4-27. Unease and frustration	0	60	254	0.0000		
	1-2	18	22		3.46	(1.75–6.86)
	3-4	3	1		12.70	(1.30–124.24)
4-28. Lack of concentration, frequent errors and mistakes.	0	51	227	0.0004		
	1-2	25	49		2.27	(1.28–4.01)
	3-4	5	3		7.42	(1.72–32.05)
4-29. Avoidance of sarin attack-related news and/or conversation	0	58	244	0.0000		
	1-2	18	34		2.23	(1.18–4.22)
	3-4	7	2		14.72	(2.98–72.74)
4-30. Apathy	0	57	217	0.2903		
	1-2	19	45		1.61	(0.87–2.96)
	3-4	2	9		0.85	(0.18–4.02)
4-31. Poor memory	0	29	157	0.0018		
	1-2	40	104		2.08	(1.22–3.57)
	3-4	12	18		3.61	(1.57–8.28)
4-32. Loss of mental toughness, becoming depressed.	0	44	198	0.0055		
	1-2	28	71		1.77	(1.03–3.06)
	3-4	8	9		4.00	(1.46–10.95)
4-33. Physical tension (such as shoulder stiffness and sweaty hands)	0	47	211	0.0089		
	1-2	27	53		2.29	(1.31–4.01)
	3-4	6	13		2.07	(0.75–5.73)
5-1. Memories of the attack trigger emotional response at the time of the attack.	0	51	216	0.0005		
	1-2	22	55		1.69	(0.95–3.03)
	3-4	9	6		6.35	(2.16–18.65)
5-2. Having trouble staying asleep.	0	45	202	0.0028		
	1-2	27	65		1.86	(1.07–3.24)
	3-4	9	10		4.04	(1.55–10.52)
5-3. Lingering memories of the attack while performing other tasks.	0	66	233	0.3914		
	1-2	12	35		1.21	(0.59–2.46)
	3-4	3	4		2.65	(0.58–12.13)

5-4. Impatience/Irritability	0	54	226	0.0132		
	1-2	18	43		1.75	(0.94–3.27)
	3-4	6	6		4.19	(1.30–13.48)
5-5. Whenever I remember the attack, I try to re-collect myself.	0	56	223	0.0007		
	1-2	17	46		1.47	(0.78–2.76)
	3-4	7	3		9.29	(2.33–37.08)
5-6. Thinking of the attack involuntarily	0	53	230	0.0025		
	1-2	24	42		2.48	(1.38–4.45)
	3-4	4	5		3.47	(0.90–13.37)
5-7. I feel that the attack did not actually happen or was not real.	0	60	240	0.0003		
	1-2	15	24		2.50	(1.24–5.06)
	3-4	6	3		8.00	(1.94–32.91)
5-8. I avoid anything that triggers memories of the attack	0	59	239	0.0006		
	1-2	19	30		2.57	(1.35–4.87)
	3-4	4	2		8.10	(1.45–45.30)
5-9. Sudden recollections of the attack scene.	0	50	237	0.0000		
	1-2	24	31		3.67	(1.99–6.78)
	3-4	7	5		6.64	(2.02–21.76)
5-10. Becoming highly sensitive	0	55	242	0.0000		
	1-2	21	29		3.19	(1.69–6.00)
	3-4	5	2		11.00	(2.08–58.19)
5-11. I try not to think about it.	0	52	235	0.0000		
	1-2	22	34		2.92	(1.58–5.41)
	3-4	9	2		20.34	(4.27–96.91)
5-12. I try not to talk about it.	0	53	236	0.0000		
	1-2	21	33		2.83	(1.52–5.28)
	3-4	8	2		17.81	(3.68–86.29)
5-13. My emotion about the attack seems to become numb.	0	58	231	0.0019		
	1-2	18	32		2.24	(1.18–4.27)
	3-4	4	2		7.97	(1.42–44.56)
5-14. I involuntarily and suddenly return to the scene of the attack and behave accordingly.	0	71	252	0.3367		
	1-2	8	15		1.89	(0.77–4.64)
	3-4	1	2		1.77	(0.16–19.86)
5-15. Falling asleep is not easy.	0	50	212	0.0016		
	1-2	20	51		1.66	(0.91–3.04)
	3-4	10	9		4.71	(1.82–12.20)

5-16. I sometimes become emotionally intense regarding the attack.	0	58	230	0.0006		
	1-2	14	38		1.46	(0.74–2.88)
	3-4	8	4		7.93	(2.31–27.25)
5-17. I try to forget the attack.	0	57	245	0.0000		
	1-2	13	24		2.33	(1.12–4.85)
	3-4	11	1		47.28	(5.98–373.68)
5-18. I cannot concentrate on things.	0	55	226	0.0007		
	1-2	19	40		1.95	(1.05–3.63)
	3-4	6	3		8.22	(1.99–33.89)
5-19. Whenever I remember the attack, I start sweating and have difficulty breathing, nausea, and a thumping heart rate.	0	62	255	0.0000		
	1-2	13	14		3.82	(1.71–8.54)
	3-4	6	3		8.23	(2.00–33.81)
5-20. I dream of the attack.	0	68	257	0.0017		
	1-2	8	13		2.33	(0.93–5.84)
	3-4	4	1		15.12	(1.66–137.47)
5-21. I feel more cautious.	0	45	221	0.0000		
	1-2	25	47		2.61	(1.46–4.67)
	3-4	12	5		11.79	(3.96–35.11)
5-22. I make efforts not to talk about the attack.	0	55	242	0.0000		
	1-2	19	29		2.88	(1.51–5.51)
	3-4	8	0			
6-1. Hypertension	0	88	394	0.0185		
	1	11	20		2.46	(1.14–5.32)
6-2. Hepatic diseases	0	96	411	0.0553		
	1	3	3		4.28	(0.85–21.54)
6-3. Cardiac diseases	0	89	410	0.0000		
	1	10	4		11.52	(3.53–37.55)
6-4. Renal diseases	0	96	412	0.0205		
	1	3	2		6.44	(1.06–39.06)
6-5. Gastrointestinal diseases	0	97	404	0.8152		
	1	2	10		0.83	(0.18–3.86)
6-6. Pulmonary diseases	0	96	410	0.1118		
	1	3	4		3.20	(0.71–14.55)
6-7. Asthma	0	97	409	0.5313		
	1	2	5		1.69	(0.32–8.82)

6-8. Diabetes	0	98	404	0.3858		
	1	1	0		0.41	(0.05–3.26)
6-9. Uterine/ovarian diseases	0	99	413	0.6245		
	1	0	1			
6-10. Ocular diseases	0	83	397	0.0000		
	1	16	17		4.50	(2.19–9.27)
6-11. Diseases of the ears/nose	0	88	407	0.0000		
	1	11	7		7.27	(2.74–19.27)
6-12. Diseases of the blood (such as anemia)	0	98	411	0.7717		
	1	1	3		1.40	(0.14–13.58)
6-13. Orthopedic diseases or injuries (such as lumbar pain and joint pain)	0	88	390	0.0596		
	1	11	24		2.03	(0.96–4.30)
6-14. Allergies (such as pollen allergy)	0	92	398	0.1661		
	1	7	16		1.89	(0.76–4.73)
6-15. Diseases of autonomic nerve	0	96	406	0.4981		
	1	3	8		1.59	(0.41–6.09)
6-16. Nerve diseases (such as depression and neurotic disease)	0	95	410	0.0266		
	1	4	4		4.32	(1.06–17.57)
6-17. Diseases of the nervous system (such as Parkinson's disease)	0	99	413	0.6245		
	1	0	1			
6-18. Endocrine diseases (such as Basedow's disease)	0	97	413	0.0371		
	1	2	1		8.52	(0.76–94.87)
6-19. Metabolic diseases (such as hypercholesteremia, hyperuricemia, and hyperlipemia)	0	92	397	0.2096		
	1	7	17		1.78	(0.72–4.41)
6-20. Cancers, malignant diseases (Which site?)	0	98	409	0.8695		
	1	1	5		0.83	(0.10–7.23)
6-21. Others()	0	94	403	0.2184		
	1	5	11		1.95	(0.66–5.74)

*0: No subjective symptoms; 1-2: slight-intermediate levels of subjective symptoms; 3-4: considerable-very high levels of subjective symptoms. However, for question 6 only, 0: no disease; 1: presence of disease

** The odds ratio in sarin-poisoned persons in cases where the odds ratio of subjective symptoms in non-sarin-poisoned persons is 1.0.

2. Disease development after sarin poisoning

The survey studied disease occurrence in sarin poisoning victims after the attack for which victims were still receiving treatment. Major diseases found in sarin-poisoning persons were diseases of the heart, kidneys, eyes, ears/nose, and nerves.

3. Sex differences in sarin victims' subjective symptoms

Tables 4 and 5 summarize the subjective symptoms outlined in Table 3 by sex. Both for subjective symptoms and diseases in treatment, the results of analyses were generally similar to the overall analysis results.

Table 4. Subjective symptoms in sarin-poisoned and non-sarin-poisoned persons (males only)

Question	* Symptom severity	Poisoned persons	Non-poisoned persons	χ^2 test	** Odds ratio	95% confidence interval
4-1. Physical fatigue	0	15	98	0.0137		
	1-2	18	38		3.09	(1.42–6.76)
	3-4	3	9		2.18	(0.53–8.97)
4-2. Getting tired easily	0	11	91	0.0016		
	1-2	18	46		3.24	(1.41–7.42)
	3-4	6	8		6.20	(1.81–21.22)
4-3. Susceptibility to cold	0	19	109	0.0269		
	1-2	14	28		2.87	(1.28–6.42)
	3-4	1	7		0.82	(0.10–7.04)
4-4. Ease of developing low fever	0	27	130	0.0530		
	1-2	5	10		2.41	(0.76–7.61)
	3-4	3	3		4.81	(0.92–25.15)
4-5. Difficulty breathing	0	25	126	0.0621		
	1-2	6	15		2.02	(0.71–5.70)
	3-4	3	3		5.04	(0.96–26.42)
4-6. Chest tightening	0	25	128	0.0593		
	1-2	8	15		2.73	(1.05–7.13)
	3-4	1	1		5.12	(0.31–84.60)
4-7. Sudden racing pulse	0	23	124	0.0038		
	1-2	8	19		2.27	(0.89–5.80)
	3-4	3	1		16.17	(1.61–162.37)
4-8. Nausea	0	30	132	0.3607		
	1-2	4	10		1.76	(0.52–5.99)
	3-4	0	0			
4-9. Susceptibility to diarrhea	0	29	124	0.2416		
	1-2	3	18		0.71	(0.20–2.58)
	3-4	3	4		3.21	(0.68–15.12)
4-10. Stomachache	0	30	122	0.5602		
	1-2	4	14		1.16	(0.36–3.78)
	3-4	1	1		4.07	(0.25–66.90)
4-11. Decreased appetite	0	31	120	0.5139		
	1-2	3	16		0.73	(0.20–2.65)
	3-4	1	1		3.87	(0.24–63.64)

4-12. Dizziness	0	24	116	0.0900		
	1-2	9	18		2.42	(0.97–6.02)
	3-4	1	1		4.83	(0.29–80.00)
4-13. Headache	0	21	113	0.0039		
	1-2	10	16		3.36	(1.34–8.41)
	3-4	2	1		10.76	(0.93–124.12)
4-14. Easily fatigued in the eyes	0	8	77	0.0011		
	1-2	23	47		4.71	(1.95–11.38)
	3-4	5	12		4.01	(1.12–14.31)
4-15. Clouded vision	0	15	86	0.0641		
	1-2	16	36		2.55	(1.14–5.70)
	3-4	4	12		1.91	(0.54–6.72)
4-16. Near-sightedness	0	15	88	0.0617		
	1-2	16	38		2.47	(1.11–5.50)
	3-4	3	7		2.51	(0.58–10.82)
4-17. Far-sightedness	0	18	84	0.5237		
	1-2	10	40		1.17	(0.49–2.76)
	3-4	5	12		1.94	(0.61–6.21)
4-18. Loss of ocular focus	0	18	96	0.0874		
	1-2	14	32		2.33	(1.04–5.22)
	3-4	3	7		2.29	(0.54–9.68)
4-19. Ocular discharge	0	25	117	0.0207		
	1-2	8	16		2.34	(0.90–6.06)
	3-4	3	2		7.02	(1.11–44.23)
4-20. Ocular sensation of a foreign body	0	25	122	0.0211		
	1-2	8	11		3.55	(1.30–9.72)
	3-4	2	3		3.25	(0.52–20.49)
4-21. Others	0	4	15	0.0187		
	1-2	2	0			
	3-4	0	0			
4-22. Sleeplessness	0	18	109	0.0082		
	1-2	14	25		3.39	(1.49–7.72)
	3-4	2	4		3.03	(0.52–17.76)
4-23. Having nightmares	0	27	122	0.0181		
	1-2	4	13		1.39	(0.42–4.60)
	3-4	3	1		13.56	(1.36–135.37)
4-24. Flashbacks to the sarin attack	0	23	121	0.0021		
	1-2	10	14		3.76	(1.49–9.49)
	3-4	2	1		10.52	(0.92–120.90)

4-25. Fear when approaching the sarin attack site.	0	27	119	0.1883		
	1-2	6	15		1.76	(0.63–4.96)
	3-4	2	2		4.41	(0.59–32.70)
4-26. Strong fear	0	31	129	0.0192		
	1-2	2	7		1.19	(0.24–6.01)
	3-4	2	0			
4-27. Uneasiness and frustration	0	26	128	0.0003		
	1-2	7	7		4.92	(1.59–15.23)
	3-4	2	0			
4-28. Lack of concentration, frequent errors and mistakes.	0	22	112	0.0033		
	1-2	11	25		2.24	(0.96–5.21)
	3-4	2	0			
4-29. Avoidance of sarin attack-related news and/or conversation	0	26	122	0.0086		
	1-2	6	13		2.17	(0.75–6.23)
	3-4	3	1		14.08	(1.41–140.75)
4-30. Apathy	0	28	106	0.5860		
	1-2	6	25		0.91	(0.34–2.43)
	3-4	0	4			
4-31. Poor memory	0	15	79	0.1007		
	1-2	14	45		1.64	(0.73–3.70)
	3-4	7	12		3.07	(1.04–9.08)
4-32. Loss of mental toughness, becoming depressed.	0	19	103	0.0389		
	1-2	13	30		2.35	(1.04–5.30)
	3-4	3	4		4.07	(0.84–19.64)
4-33. Physical tension (such as shoulder stiffness and sweaty hands)	0	20	105	0.0527		
	1-2	13	28		2.44	(1.08–5.50)
	3-4	2	3		3.50	(0.55–22.30)
5-1. Memories of the attack trigger emotional response at the time of the attack.	0	22	114	0.0029		
	1-2	9	19		2.45	(0.98–6.13)
	3-4	4	2		10.36	(1.79–60.10)
5-2. Having trouble staying asleep.	0	19	101	0.0499		
	1-2	13	27		2.56	(1.12–5.83)
	3-4	3	6		2.66	(0.61–11.56)
5-3. Lingering memories of the attack while performing other tasks.	0	27	115	0.2127		
	1-2	6	15		1.70	(0.60–4.80)
	3-4	2	2		4.26	(0.57–31.61)

5-4. Impatience/Irritability	0	23	111	0.1066		
	1-2	8	19		2.03	(0.79–5.20)
	3-4	3	4		3.62	(0.76–17.27)
5-5. Whenever I remember the attack, I try to re-collect myself.	0	25	114	0.0465		
	1-2	7	18		1.77	(0.67–4.70)
	3-4	3	2		6.84	(1.09–43.10)
5-6. Thinking of the attack involuntarily.	0	24	119	0.0093		
	1-2	8	14		2.83	(1.07–7.50)
	3-4	3	2		7.44	(1.18–46.93)
5-7. I feel that the attack did not actually happen or was not real.	0	26	121	0.0019		
	1-2	5	11		2.12	(0.68–6.61)
	3-4	4	1		18.62	(2.00–173.45)
5-8. I avoid anything that triggers memories of the attack	0	26	118	0.0107		
	1-2	6	13		2.09	(0.73–6.02)
	3-4	3	1		13.62	(1.36–136.16)
5-9. Sudden recollections of the attack scene.	0	23	118	0.0006		
	1-2	8	16		2.57	(0.98–6.69)
	3-4	4	1		20.52	(2.19–192.07)
5-10. Becoming highly sensitive.	0	21	119	0.0000		
	1-2	11	14		4.45	(1.78–11.13)
	3-4	3	0			
5-11. I try not to think about it.	0	22	119	0.0000		
	1-2	8	14		3.09	(1.16–8.24)
	3-4	5	0			
5-12. I try not to talk about it.	0	24	119	0.0000		
	1-2	6	14		2.13	(0.74–6.09)
	3-4	5	0			
5-13. My emotion about the attack seems to become numb.	0	22	119	0.0001		
	1-2	11	14		4.25	(1.71–10.57)
	3-4	2	0			
5-14. I involuntarily and suddenly return to the scene of the attack and behave accordingly.	0	28	124	0.0830		
	1-2	6	8		3.32	(1.07–10.34)
	3-4	0	1			
5-15. Falling asleep is not easy.	0	20	116	0.0002		
	1-2	9	14		3.73	(1.42–9.76)
	3-4	6	4		8.70	(2.25–33.60)

5-16. I sometimes become emotionally intense regarding the attack.	0	25	121	0.0117		
	1-2	7	12		2.82	(1.01–7.88)
	3-4	3	2		7.26	(1.15–45.73)
5-17. I try to forget the attack.	0	24	123	0.0001		
	1-2	6	9		3.42	(1.11–10.49)
	3-4	5	1		25.63	(2.86–229.22)
5-18. I cannot concentrate on things.	0	24	111	0.0017		
	1-2	8	22		1.68	(0.67–4.23)
	3-4	3	0			
5-19. Whenever I remember the attack, I start sweating and have difficulty breathing, nausea, and a thumping heart rate.	0	27	130	0.0001		
	1-2	6	2		14.44	(2.77–75.45)
	3-4	2	2		4.81	(0.65–35.70)
5-20. I dream of the attack.	0	27	126	0.0004		
	1-2	5	7		3.33	(0.98–11.30)
	3-4	3	0			
5-21. I feel more cautious.	0	19	116	0.0000		
	1-2	11	17		3.95	(1.61–9.72)
	3-4	5	1		30.53	(3.38–275.82)
5-22. I make efforts not to talk about the attack.	0	22	121	0.0000		
	1-2	8	13		3.38	(1.26–9.12)
	3-4	5	0			
6-1. Hypertension	0	34	181	0.2909		
	1	5	15		1.77	(0.60–5.21)
6-2. Hepatic diseases	0	36	194	0.0084		
	1	3	2		8.08	(1.30–50.10)
6-3. Cardiac diseases	0	35	192	0.0098		
	1	4	4		5.49	(1.31–22.97)
6-4. Renal diseases	0	36	195	0.0015		
	1	3	1		16.25	(1.64–160.62)
6-5. Gastrointestinal diseases	0	37	191	0.3872		
	1	2	5		2.06	(0.39–11.05)
6-6. Pulmonary diseases	0	38	192	0.8362		
	1	1	4		1.26	(0.14–11.62)
6-7. Asthma	0	38	193	0.6486		
	1	1	3		1.69	(0.17–16.71)

6-8. Diabetes	0	39	186	0.1494		
	1	0	10			
6-9. Uterine/ovarian diseases	0	39	196	#DIV/0!		
	1	0	0			
6-10. Ocular diseases	0	32	187	0.0025		
	1	7	9		4.55	(1.58–13.07)
6-11. Diseases of the ears/nose	0	36	195	0.0015		
	1	3	1		16.25	(1.64–160.62)
6-12. Diseases of the blood (such as anemia)	0	39	194	0.5264		
	1	0	2			
6-13. Orthopedic diseases or injuries (such as lumbar pain and joint pain)	0	35	187	0.1576		
	1	4	9		2.37	(0.69–8.14)
6-14. Allergies (such as pollen allergy)	0	38	191	0.9962		
	1	1	5		1.01	(0.11–8.85)
6-15. Diseases of autonomic nerve	0	37	195	0.0190		
	1	2	1		10.54	(0.93–119.26)
6-16. Nerve diseases (such as depression and neurotic disease)	0	37	196	0.0015		
	1	2	0			
6-17. Diseases of the nervous system (such as Parkinson's disease)	0	39	196	1.0000		
	1	0	0			
6-18. Endocrine diseases (such as Basedow's disease)	0	39	196	1.0000		
	1	0	0			
6-19. Metabolic diseases (such as hypercholesteremia, hyperuricemia, and hyperlipemia)	0	37	190	0.5156		
	1	2	6		1.71	(0.33–8.81)
6-20. Cancers, malignant diseases (Which site?)	0	38	193	0.6486		
	1	1	3		1.69	(0.17–16.71)
6-21. Others ()	0	36	188	0.3296		
	1	3	8		1.96	(0.50–7.74)

* 0: No subjective symptoms; 1-2: slight-intermediate levels of subjective symptoms; 3-4: considerable-very high levels of subjective symptoms. However, for question 6 only, 0: no disease; 1: presence of disease

** The odds ratio in sarin-poisoned persons in cases where the odds ratio of subjective symptoms in non-sarin-poisoned persons is 1.0.

Table 5. Subjective symptoms in sarin-poisoned and non-sarin-poisoned persons (females only)

Question	* Symptom severity	Poisoned persons	Non-poisoned persons	χ^2 test	** Odds ratio	95% confidence interval
4-1. Physical fatigue	0	23	103	0.0197		
	1-2	24	47		2.29	(1.17–4.46)
	3-4	4	5		3.58	(0.89–14.39)
4-2. Getting tired easily	0	21	95	0.0175		
	1-2	21	49		1.94	(0.97–3.89)
	3-4	10	13		3.48	(1.35–9.00)
4-3. Susceptibility to cold	0	30	109	0.0650		
	1-2	12	41		1.06	(0.50–2.27)
	3-4	8	9		3.23	(1.15–9.09)
4-4. Ease of developing low fever	0	40	135	0.5308		
	1-2	8	16		1.69	(0.67–4.23)
	3-4	1	3		1.13	(0.11–11.11)
4-5. Difficulty breathing	0	39	135	0.6205		
	1-2	6	13		1.60	(0.57–4.48)
	3-4	1	5		0.69	(0.08–6.10)
4-6. Chest tightening	0	40	129	0.8571		
	1-2	7	19		1.19	(0.47–3.03)
	3-4	1	5		0.65	(0.07–5.68)
4-7. Sudden racing pulse	0	35	124	0.5046		
	1-2	12	27		1.57	(0.72–3.42)
	3-4	1	4		0.89	(0.10–8.18)
4-8. Nausea	0	41	142	0.0917		
	1-2	7	8		3.03	(1.04–8.85)
	3-4	0	1			
4-9. Susceptibility to diarrhea	0	38	131	0.0505		
	1-2	7	20		1.21	(0.47–3.07)
	3-4	3	1		10.34	(1.05–102.31)
4-10. Stomachache	0	37	129	0.0474		
	1-2	8	12		2.32	(0.88–6.11)
	3-4	1	0			
4-11. Decreased appetite	0	39	122	0.9806		
	1-2	6	19		0.99	(0.37–2.65)
	3-4	0	0			

4-12. Dizziness	0	30	115	0.0236		
	1-2	16	22		2.79	(1.31–5.96)
	3-4	2	4		1.92	(0.33–10.97)
4-13. Headache	0	25	100	0.1008		
	1-2	18	34		2.12	(1.03–4.35)
	3-4	3	6		2.00	(0.47–8.56)
4-14. Easily fatigued in the eyes	0	10	78	0.0000		
	1-2	24	52		3.60	(1.59–8.15)
	3-4	15	12		9.75	(3.57–26.63)
4-15. Clouded vision	0	17	91	0.0003		
	1-2	21	45		2.50	(1.20–5.20)
	3-4	8	5		8.56	(2.50–29.35)
4-16. Near-sightedness	0	22	87	0.0539		
	1-2	14	44		1.26	(0.59–2.70)
	3-4	8	9		3.52	(1.22–10.16)
4-17. Far-sightedness	0	23	92	0.1935		
	1-2	17	35		1.94	(0.93–4.06)
	3-4	4	10		1.60	(0.46–5.56)
4-18. Loss of ocular focus	0	26	100	0.0052		
	1-2	13	38		1.32	(0.61–2.82)
	3-4	3	0			
4-19. Ocular discharge	0	32	116	0.0954		
	1-2	11	23		1.73	(0.76–3.93)
	3-4	2	1		7.25	(0.64–82.53)
4-20. Ocular sensation of a foreign body	0	32	122	0.0160		
	1-2	12	15		3.05	(1.30–7.16)
	3-4	2	2		3.81	(0.52–28.12)
4-21. Others	0	5	20	0.0778		
	1-2	2	1		8.00	(0.60–106.94)
	3-4	0	0			
4-22. Sleeplessness	0	26	102	0.0612		
	1-2	18	30		2.35	(1.14–4.86)
	3-4	3	7		1.68	(0.41–6.95)
4-23. Having nightmares	0	35	124	0.0202		
	1-2	12	17		2.50	(1.09–5.73)
	3-4	1	0			
4-24. Flashbacks to the sarin attack	0	24	122	0.0000		
	1-2	20	19		5.35	(2.49–11.50)
	3-4	3	0			

4-25. Fear when approaching the sarin attack site.	0	27	121	0.0005		
	1-2	16	19		3.77	(1.72–8.27)
	3-4	3	2		6.72	(1.07–42.21)
4-26. Strong fear	0	42	131	0.9160		
	1-2	3	8		1.17	(0.30–4.61)
	3-4	1	2		1.56	(0.14–17.63)
4-27. Unease and frustration	0	34	125	0.0503		
	1-2	11	15		2.70	(1.13–6.41)
	3-4	1	1		3.68	(0.22–60.31)
4-28. Lack of concentration, frequent errors and mistakes.	0	29	114	0.0369		
	1-2	14	24		2.29	(1.06–4.98)
	3-4	3	3		3.93	(0.75–20.50)
4-29. Avoidance of sarin attack-related news and/or conversation	0	32	121	0.0029		
	1-2	12	21		2.16	(0.96–4.85)
	3-4	4	1		15.13	(1.63–140.05)
4-30. Apathy	0	29	110	0.0820		
	1-2	13	20		2.47	(1.10–5.54)
	3-4	2	5		1.52	(0.28–8.22)
4-31. Poor memory	0	14	77	0.0144		
	1-2	26	59		2.42	(1.16–5.04)
	3-4	5	6		4.58	(1.23–17.10)
4-32. Loss of mental toughness, becoming depressed.	0	25	94	0.1066		
	1-2	15	41		1.38	(0.66–2.88)
	3-4	5	5		3.76	(1.01–14.02)
4-33. Physical tension (such as shoulder stiffness and sweaty hands)	0	27	105	0.1321		
	1-2	14	25		2.18	(1.00–4.75)
	3-4	4	10		1.56	(0.45–5.34)
5-1. Memories of the attack trigger emotional response at the time of the attack.	0	29	101	0.0802		
	1-2	13	36		1.26	(0.59–2.68)
	3-4	5	4		4.35	(1.10–17.27)
5-2. Having trouble staying asleep.	0	26	100	0.0183		
	1-2	14	38		1.42	(0.67–3.00)
	3-4	6	4		5.77	(1.52–21.96)
5-3. Lingering memories of the attack while performing other tasks.	0	39	117	0.9226		
	1-2	6	20		0.90	(0.34–2.40)
	3-4	1	2		1.50	(0.13–17.00)

5-4. Impatience/Irritability	0	31	114	0.0975		
	1-2	10	24		1.53	(0.66–3.54)
	3-4	3	2		5.52	(0.88–34.48)
5-5. Whenever I remember the attack, I try to re-collect myself.	0	31	108	0.0129		
	1-2	10	28		1.24	(0.55–2.84)
	3-4	4	1		13.94	(1.50–129.26)
5-6. Thinking of the attack involuntarily	0	29	110	0.1148		
	1-2	16	28		2.17	(1.04–4.53)
	3-4	1	3		1.26	(0.13–12.61)
5-7. I feel that the attack did not actually happen or was not real.	0	34	118	0.0516		
	1-2	10	13		2.67	(1.08–6.62)
	3-4	2	2		3.47	(0.47–25.56)
5-8. I avoid anything that triggers memories of the attack	0	33	120	0.0315		
	1-2	13	17		2.78	(1.23–6.30)
	3-4	1	1		3.64	(0.22–59.71)
5-9. Sudden recollections of the attack scene.	0	27	118	0.0003		
	1-2	16	15		4.66	(2.05–10.58)
	3-4	3	4		3.28	(0.69–15.51)
5-10. Becoming highly sensitive	0	34	122	0.0741		
	1-2	10	15		2.39	(0.99–5.80)
	3-4	2	2		3.59	(0.49–26.42)
5-11. I try not to think about it.	0	30	115	0.0034		
	1-2	14	20		2.68	(1.21–5.93)
	3-4	4	2		7.67	(1.34–43.87)
5-12. I try not to talk about it.	0	29	116	0.0030		
	1-2	15	19		3.16	(1.43–6.96)
	3-4	3	2		6.00	(0.96–37.59)
5-13. My emotion about the attack seems to become numb.	0	36	111	0.4911		
	1-2	7	18		1.20	(0.46–3.10)
	3-4	2	2		3.08	(0.42–22.68)
5-14. I involuntarily and suddenly return to the scene of the attack and behave accordingly.	0	43	127	0.7091		
	1-2	2	7		0.84	(0.17–4.22)
	3-4	1	1		2.95	(0.18–48.24)
5-15. Falling asleep is not easy.	0	30	95	0.3679		
	1-2	11	37		0.94	(0.43–2.07)
	3-4	4	5		2.53	(0.64–10.04)

5-16. I sometimes become emotionally intense regarding the attack.	0	33	108	0.0141		
	1-2	7	26		0.88	(0.35–2.21)
	3-4	5	2		8.18	(1.52–44.14)
5-17. I try to forget the attack.	0	33	121	0.0001		
	1-2	7	15		1.71	(0.64–4.54)
	3-4	6	0			
5-18. I cannot concentrate on things.	0	31	114	0.0608		
	1-2	11	18		2.25	(0.96–5.25)
	3-4	3	3		3.68	(0.71–19.13)
5-19. Whenever I remember the attack, I start sweating and have difficulty breathing, nausea, and a thumping heart rate.	0	35	124	0.0061		
	1-2	7	12		2.07	(0.76–5.64)
	3-4	4	1		14.17	(1.53–130.90)
5-20. I dream of the attack.	0	41	130	0.5780		
	1-2	3	6		1.59	(0.38–6.62)
	3-4	1	1		3.17	(0.19–51.83)
5-21. I feel more cautious.	0	26	104	0.0033		
	1-2	14	30		1.87	(0.87–4.02)
	3-4	7	4		7.00	(1.90–25.72)
5-22. I make efforts not to talk about the attack.	0	33	120	0.0013		
	1-2	11	16		2.50	(1.06–5.90)
	3-4	3	0			
6-1. Hypertension	0	54	212	0.0069		
	1	6	5		4.71	(1.39–16.02)
6-2. Hepatic diseases	0	60	216	0.5983		
	1	0	1			
6-3. Cardiac diseases	0	54	217	0.0000		
	1	6	0			
6-4. Renal diseases	0	60	216	0.5983		
	1	0	1			
6-5. Gastrointestinal diseases	0	60	212	0.2354		
	1	0	5			
6-6. Pulmonary diseases	0	58	217	0.0069		
	1	2	0			
6-7. Asthma	0	59	215	0.6217		
	1	1	2		1.82	(0.16–20.44)

6-8. Diabetes	0	59	217	0.0568		
	1	1	0			
6-9. Uterine/ovarian diseases	0	60	216	0.5983		
	1	0	1			
6-10. Ocular diseases	0	51	209	0.0012		
	1	9	8		4.61	(1.70–12.54)
6-11. Diseases of the ears/nose	0	52	211	0.0009		
	1	8	6		5.41	(1.80–16.27)
6-12. Diseases of the blood (such as anemia)	0	59	216	0.3288		
	1	1	1		3.66	(0.23–59.41)
6-13. Orthopedic diseases or injuries (such as lumbar pain and joint pain)	0	53	202	0.2280		
	1	7	15		1.78	(0.69–4.58)
6-14. Allergies (such as pollen allergy)	0	54	206	0.1590		
	1	6	11		2.08	(0.74–5.88)
6-15. Diseases of autonomic nerve	0	59	210	0.5233		
	1	1	7		0.51	(0.06–4.22)
6-16. Nerve diseases (such as depression and neurotic disease)	0	58	213	0.4828		
	1	2	4		1.84	(0.33–10.28)
6-17. Diseases of the nervous system (such as Parkinson's disease)	0	60	216	0.5983		
	1	0	1			
6-18. Endocrine diseases (such as Basedow's disease)	0	58	216	0.0571		
	1	2	1		7.45	(0.66–83.59)
6-19. Metabolic diseases (such as hypercholesteremia, hyperuricemia, and hyperlipemia)	0	55	206	0.3374		
	1	5	11		1.70	(0.57–5.11)
6-20. Cancers, malignant diseases (Which site?)	0	60	215	0.4555		
	1	0	2			
6-21. Others ()	0	58	214	0.3151		
	1	2	3		2.46	(0.40–15.07)

* 0: No subjective symptoms; 1-2: slight-intermediate levels of subjective symptoms; 3-4: considerable-very high levels of subjective symptoms. However, for question 6 only, 0: no disease; 1: presence of disease

** The odds ratio in sarin-poisoned persons in cases where the odds ratio of subjective symptoms in non-sarin-poisoned persons is 1.0.

4. Subjective symptom in victims classified by medical action

To examine whether there was any association between symptom severity after the attack and the presence of current subjective symptoms, the sarin-poisoned victims were divided into two groups: 1) individuals who were admitted as inpatients or had consulted medical facilities after the attack (relatively severe group), and 2) individuals who experienced subjective symptoms but did not consult medical facilities (mild group). The prevalence of long-term subjective symptoms was compared between these two groups (Table 6). The relatively severe group presented subjective symptoms including physical fatigue, ocular fatigue, thumping heart rate, and sleeplessness, as well as and mental symptoms including feeling uneasy, avoiding the attack-related news and/or conversation, trying to re-collect oneself when remembering the attack, trying not to think or talk about the attack, and trying to forget the attack.

Regarding diseases, many patients who were receiving treatment for allergies were part of the group who had consulted at medical facilities.

Table 6. Subjective symptoms in victims classified by medical care received (all respondents)

Question	* Symptom severity	**Medical action 1-2	** Medical action 3	χ^2 test	*** Odds ratio	95% confidence interval
4-1. Physical fatigue	0	19	36	0.0683		
	1-2	27	20		2.56	(1.15–5.70)
	3-4	5	6		1.58	(0.43–5.85)
4-2. Getting tired easily	0	15	35	0.0137		
	1-2	23	19		2.82	(1.20–6.66)
	3-4	13	8		3.79	(1.30–11.04)
4-3. Susceptibility to cold	0	29	38	0.6211		
	1-2	14	15		1.22	(0.51–2.93)
	3-4	8	6		1.75	(0.55–5.59)
4-4. Ease of developing low fever	0	36	51	0.1071		
	1-2	11	5		3.12	(1.00–9.74)
	3-4	3	2		2.13	(0.34–13.37)
4-5. Difficulty breathing	0	31	52	0.0122		
	1-2	11	4		4.61	(1.35–15.75)
	3-4	5	2		4.19	(0.77–22.93)
4-6. Chest tightening	0	32	51	0.0206		
	1-2	14	5		4.46	(1.47–13.58)
	3-4	2	3		1.06	(0.17–6.71)
4-7. Sudden racing pulse	0	29	49	0.0489		
	1-2	15	9		2.82	(1.09–7.25)
	3-4	4	2		3.38	(0.58–19.61)
4-8. Nausea	0	38	54	0.0714		
	1-2	10	4		3.55	(1.04–12.17)
	3-4	0	1			
4-9. Susceptibility to diarrhea	0	40	48	0.1052		
	1-2	3	10		0.36	(0.09–1.40)
	3-4	5	2		3.00	(0.55–16.30)
4-10. Stomachache	0	38	53	0.1987		
	1-2	7	6		1.63	(0.51–5.23)
	3-4	2	0			
4-11. Decreased appetite	0	37	53	0.2781		
	1-2	8	6		1.91	(0.61–5.96)
	3-4	1	0			

4-12. Dizziness	0	27	49	0.0074		
	1-2	19	8		4.31	(1.67–11.15)
	3-4	2	2		1.81	(0.24–13.62)
4-13. Headache	0	26	40	0.4204		
	1-2	17	15		1.74	(0.74–4.09)
	3-4	3	3		1.54	(0.29–8.21)
4-14. Easily fatigued in the eyes	0	7	27	0.0013		
	1-2	26	26		3.86	(1.43–10.41)
	3-4	16	8		7.71	(2.35–25.31)
4-15. Clouded vision	0	16	30	0.1133		
	1-2	22	22		1.88	(0.80–4.37)
	3-4	10	6		3.13	(0.96–10.17)
4-16. Near-sightedness	0	19	34	0.0898		
	1-2	17	18		1.69	(0.71–4.03)
	3-4	10	5		3.58	(1.07–12.02)
4-17. Far-sightedness	0	21	33	0.3607		
	1-2	18	18		1.57	(0.67–3.68)
	3-4	7	5		2.20	(0.62–7.84)
4-18. Loss of ocular focus	0	24	35	0.3746		
	1-2	18	17		1.54	(0.67–3.58)
	3-4	5	3		2.43	(0.53–11.14)
4-19. Ocular discharge	0	33	46	0.2664		
	1-2	12	9		1.86	(0.70–4.92)
	3-4	4	2		2.79	(0.48–16.13)
4-20. Ocular sensation of a foreign body	0	32	46	0.1787		
	1-2	12	11		1.57	(0.62–3.99)
	3-4	4	1		5.75	(0.61–53.86)
4-21.-Others	0	5	10	0.1337		
	1-2	3	1		6.00	(0.49–73.45)
	3-4	0	0			
4-22. Sleeplessness	0	22	40	0.0728		
	1-2	22	16		2.50	(1.09–5.72)
	3-4	4	3		2.42	(0.50–11.83)
4-23. Having nightmares	0	32	49	0.0285		
	1-2	12	9		2.04	(0.77–5.40)
	3-4	4	0			
4-24. Flashbacks to the sarin attack	0	25	41	0.0199		
	1-2	18	18		1.64	(0.72–3.73)
	3-4	5	0			

4-25. Fear when approaching the sarin attack site.	0	28	47	0.0082		
	1-2	13	12		1.82	(0.73–4.53)
	3-4	6	0			
4-26. Strong fear	0	40	54	0.4171		
	1-2	4	4		1.35	(0.32–5.73)
	3-4	3	1		4.05	(0.41–40.39)
4-27. Unease and frustration	0	30	51	0.0233		
	1-2	14	7		3.40	(1.23–9.36)
	3-4	3	1		5.10	(0.51–51.26)
4-28. Lack of concentration, frequent errors and mistakes.	0	27	42	0.1767		
	1-2	15	14		1.67	(0.70–3.99)
	3-4	5	2		3.89	(0.70–21.49)
4-29. Avoidance of sarin attack-related news and/or conversation	0	28	51	0.0023		
	1-2	16	5		5.83	(1.93–17.60)
	3-4	5	3		3.04	(0.67–13.66)
4-30. Apathy	0	32	40	0.2505		
	1-2	13	11		1.48	(0.58–3.74)
	3-4	1	5		0.25	(0.03–2.25)
4-31. Poor memory	0	17	29	0.1462		
	1-2	23	22		1.78	(0.77–4.12)
	3-4	9	5		3.07	(0.88–10.68)
4-32. Loss of mental toughness, becoming depressed.	0	24	36	0.0796		
	1-2	14	19		1.11	(0.47–2.62)
	3-4	9	3		4.50	(1.10–18.34)
4-33. Physical tension (such as shoulder stiffness and sweaty hands)	0	27	36	0.8808		
	1-2	16	18		1.19	(0.51–2.74)
	3-4	4	4		1.33	(0.31–5.82)
5-1. Memories of the attack trigger emotional response at the time of the attack.	0	27	44	0.0437		
	1-2	16	8		3.26	(1.23–8.64)
	3-4	6	5		1.96	(0.54–7.03)
5-2. Having trouble staying asleep.	0	26	34	0.7862		
	1-2	15	19		1.03	(0.44–2.41)
	3-4	6	5		1.57	(0.43–5.71)
5-3. Lingering memories of the attack while performing other tasks.	0	36	49	0.2551		
	1-2	7	8		1.19	(0.40–3.58)
	3-4	4	1		5.44	(0.58–50.79)
5-4. Impatience/Irritability	0	26	43	0.0870		
	1-2	13	12		1.79	(0.71–4.51)
	3-4	6	2		4.96	(0.93–26.43)

5-5. Whenever I remember the attack, I try to re-collect myself.	0	29	46	0.0414		
	1-2	10	10		1.59	(0.59–4.28)
	3-4	8	2		6.34	(1.26–31.99)
5-6. Thinking of the attack involuntarily.	0	29	44	0.1276		
	1-2	15	13		1.75	(0.73–4.21)
	3-4	4	1		6.07	(0.65–57.06)
5-7. I feel that the attack did not actually happen or was not real.	0	34	44	0.5725		
	1-2	8	11		0.94	(0.34–2.60)
	3-4	5	3		2.16	(0.48–9.66)
5-8. I avoid anything that triggers memories of the attack	0	30	47	0.0518		
	1-2	13	10		2.04	(0.79–5.23)
	3-4	5	1		7.83	(0.87–70.37)
5-9. Sudden recollections of the attack scene.	0	28	39	0.4986		
	1-2	14	15		1.30	(0.54–3.12)
	3-4	5	3		2.32	(0.51–10.52)
5-10. Becoming highly sensitive.	0	28	46	0.0424		
	1-2	14	11		2.09	(0.83–5.24)
	3-4	5	1		8.21	(0.91–73.97)
5-11. I try not to think about it.	0	26	43	0.0185		
	1-2	14	13		1.78	(0.73–4.37)
	3-4	9	2		7.44	(1.49–37.15)
5-12. I try not to talk about it.	0	28	42	0.0590		
	1-2	12	14		1.29	(0.52–3.19)
	3-4	8	2		6.00	(1.19–30.37)
5-13. My emotion about the attack seems to become numb.	0	29	47	0.0714		
	1-2	15	8		3.04	(1.15–8.06)
	3-4	2	2		1.62	(0.22–12.14)
5-14. I involuntarily and suddenly return to the scene of the attack and behave accordingly.	0	40	51	0.9819		
	1-2	5	6		1.06	(0.30–3.73)
	3-4	1	1		1.28	(0.08–21.02)
5-15. Falling asleep is not easy.	0	28	40	0.0705		
	1-2	9	15		0.86	(0.33–2.23)
	3-4	9	3		4.29	(1.06–17.26)
5-16. I sometimes become emotionally intense regarding the attack.	0	31	44	0.1051		
	1-2	8	12		0.95	(0.35–2.59)
	3-4	7	2		4.97	(0.97–25.54)
5-17. I try to forget the attack.	0	30	46	0.0428		
	1-2	7	9		1.19	(0.40–3.55)
	3-4	10	3		5.11	(1.30–20.11)

5-18. I cannot concentrate on things.	0	29	42	0.0726		
	1-2	12	13		1.34	(0.53–3.34)
	3-4	6	1		8.69	(0.99–76.05)
5-19. Whenever I remember the attack, I start sweating and have difficulty breathing, nausea, and a thumping heart rate.	0	32	49	0.0945		
	1-2	9	7		1.97	(0.67–5.82)
	3-4	6	2		4.59	(0.87–24.19)
5-20. I dream of the attack.	0	38	50	0.7596		
	1-2	5	6		1.10	(0.31–3.86)
	3-4	3	2		1.97	(0.31–12.41)
5-21. I feel more cautious.	0	24	38	0.0414		
	1-2	14	18		1.23	(0.52–2.93)
	3-4	10	3		5.28	(1.32–21.14)
5-22. I make efforts not to talk about the attack.	0	29	43	0.0984		
	1-2	12	13		1.37	(0.55–3.42)
	3-4	7	2		5.19	(1.01–26.77)
6-1. Hypertension	0	52	68	0.9812		
	1	6	7		1.12	(0.36–3.54)
6-2. Hepatic diseases	0	57	73	0.9362		
	1	1	2		0.64	(0.06–7.24)
6-3. Cardiac diseases	0	53	69	0.9917		
	1	5	6		1.08	(0.31–3.75)
6-4. Renal diseases	0	57	73	0.9362		
	1	1	2		0.64	(0.06–7.24)
6-5. Gastrointestinal diseases	0	56	74	0.7176		
	1	2	1		2.64	(0.23–29.88)
6-6. Pulmonary diseases	0	53	75	0.0348		
	1	5	0			
6-7. Asthma	0	55	74	0.4377		
	1	3	1		4.04	(0.41–39.86)
6-8. Diabetes	0	58	72	0.3052		
	1	0	3			
6-9. Uterine/ovarian diseases	0	58	75	1.0000		
	1	0	0			
6-10. Ocular diseases	0	47	67	0.3986		
	1	11	8		1.96	(0.73–5.24)
6-11. Diseases of the ears/nose	0	50	71	0.2403		
	1	8	4		2.84	(0.81–9.95)

6-12. Diseases of the blood (such as anemia)	0	57	75	0.5213		
	1	1	0			
6-13. Orthopedic diseases or injuries (such as lumbar pain and joint pain)	0	51	68	0.8781		
	1	7	7		1.33	(0.44–4.04)
6-14. Allergies (such as pollen allergy)	0	50	73	0.0544		
	1	8	2		5.84	(1.19–28.66)
6-15. Diseases of autonomic nerve	0	56	72	0.9863		
	1	2	3		0.86	(0.14–5.31)
6-16. Nerve diseases (such as depression and neurotic disease)	0	54	74	0.2469		
	1	4	1		5.48	(0.60–50.43)
6-17. Diseases of the nervous system (such as Parkinson's disease)	0	58	75	1.0000		
	1	0	0			
6-18. Endocrine diseases (such as Basedow's disease)	0	56	75	0.2691		
	1	2	0			
6-19. Metabolic diseases (such as hypercholesteremia, hyperuricemia, and hyperlipemia)	0	55	69	0.8128		
	1	3	6		0.63	(0.15–2.62)
6-20. Cancers, malignant diseases (Which site?)	0	57	75	0.5213		
	1	1	0			
6-21. Others ()	0	54	73	0.5070		
	1	4	2		2.70	(0.48–15.30)

* 0: No subjective symptoms; 1-2: slight-intermediate levels of subjective symptoms; 3-4: considerable-very high levels of subjective symptoms. However, for question 6 only, 0: no disease; 1: presence of disease

** 1-2: hospitalization or consultation at medical facilities, 3: no visit to medical facilities

*** The odds ratio of subject symptoms in persons who consulted at the medical facilities or were hospitalized in case where the odds ratio of subjective symptoms in persons who don't consult at the medical facilities is 1.0.

Summary

Overall, the presence of physical or ocular fatigue were evaluated as aftereffects at 5 years post-sarin attack, and were also found frequently in sarin-poisoned victims 10 years after the attack. In addition, these aftereffects were also found in victims with severe symptoms at the time of the attack. Strong subjective symptoms remained in those victims. A similar phenomenon was observed regarding mental aftereffects. Analysis of the survey results indicated that both physical and mental complaints persisted in sarin-poisoned victims more than 10 years after the attack, compared with non-sarin-poisoned victims.

Supplement

Table 7. Presence or absence of physical and mental subjective symptoms

	Presence (%)	Absence (%)	No answer (%)	Total
Poisoned victims				
Physical symptoms (4.1-13)	68 (69)	22 (22)	9 (9)	99
Ocular symptoms (4.14-21)	72 (73)	15 (15)	12 (12)	99
Mental symptoms (4.22-32)	72 (73)	13 (13)	14 (14)	44
Non-poisoned victims				
Physical symptoms (4.1-13)	162 (39)	153 (37)	99 (24)	414
Ocular symptoms (4.14-21)	158 (38)	127 (31)	129 (31)	414
Mental symptoms (4.22-32)	182 (44)	108 (26)	124 (30)	414

Presence: individuals who responded affirmatively to one or more questions.

Absence: individuals who responded "0" or did not answer in all questions.

Non-answer: individuals who did not answer any questions.

Acknowledgment

We deeply thank Dr. Hisato Naito, a Doctoral student at Nagoya University Graduate School (at present, a Lecturer of Department of Public Health, Fujita Health University School of Medicine) for cooperating in the analyses of the questionnaires.

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2. Health crisis management system in Matsumoto City: A study on health and medical actions and crisis management system after sarin exposure. Health and hygiene in Matsumoto City. Additional volume Vol. 22, March, 2000

(3) Health survey activities by medical checkups

[1st checkup: July 1994, three weeks after the attack]

Date of implementation: July 23 and 24

Place: Matsumoto City Kaichi Health Center

Contents: Clinical examinations, blood examinations, health consultation

Staff: The Third Department of Internal Medicine, Shinshu University School of Medicine, Matsumoto Healthcare Center, Matsumoto City Medical Association, Matsumoto City

Subjects: Residents who lived in the area where the victims were present and desired to receive a medical checkup

The number of persons desiring a medical checkup in advance: 150

The number of persons who received a medical checkup: 155

The results: No abnormality 96 persons

Mild abnormalities 59 persons

Required detailed examinations 45 persons

Regular hospital visit 23 persons (Persons who visited the hospital regularly, regardless of presence or absence of abnormalities)

Regarding detailed results, please refer to "Report on the surveys of the toxic gas poisoning in Matsumoto City" published in March 1995 (page 143–150; the results of the medical checkups and analyses).

[2nd checkup: September 1994, three months after the attack]

Date of implementation: September 29 and 30

Place: Matsumoto City Medical Association Medical Center

Contents: Blood examinations (erythrocyte true cholinesterase (ChE))

Subjects: Persons with a decreased erythrocyte true ChE at the medical checkup three weeks after the attack

The number of subjects: 45

The number of persons who received a medical checkup: 13

The results: No abnormality 13 persons

[3rd checkup: July 1995, one year after the attack]

Date of implementation: July 17, 18, and 19

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: Persons with constricted pupils or a decreased ChE value at the acute stage or persons who desired to receive a medical checkup

The number of subjects: 154

The number of persons who received a medical checkup: 72

The results: Grade A (No abnormality associated with the poisoning) 49

persons

Grade B (Although abnormalities were present in clinical examinations and results, the association with the poisoning was low) 18 persons

Grade C (Presence of abnormalities that were suspected to be associated with the poisoning) 5 persons

Regarding details results, please refer to “Health crisis management system in Matsumoto City” published in March 2000 (Page 36; the health survey results (3rd–7th)).

[4th checkup: February 1996, one year and eight months after the attack]

Date of implementation: February 29, March 1

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

The subjects: Persons who were evaluated as Grade B or C at the 3rd checkup in July, 1995

Persons who were subjects for the 3rd checkups in July, 1995 and had not received a checkup

Persons who were determined to need a detailed check in the 4th questionnaire surveys from February, 1996 (including persons who desired to receive a medical checkup)

The number of subjects: 121

The number of persons who received a medical checkup: 29

The results: Grade A 15 persons

Grade B 9 persons

Grade C 5 persons

Regarding detailed results, please refer to “Health crisis management system in Matsumoto City” published in March 2000 (page 36–37; the health survey results (3rd–7th)).

[5th checkup: March 1997, two years and eight months after the attack]

Date of implementation: March 13 and 14

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: Persons who exhibited abnormalities that appeared to be associated with sarin in previous medical checkups

Persons who were determined to require detailed examinations via the 5th questionnaire surveys in February 1997 (including those who desired a medical checkup)

The number of subjects: 87

The number of persons who received a medical checkup: 31

The results: Grade A 25 persons

Grade B 3 persons

Grade C 3 persons

Regarding detailed results, please refer to "Health crisis management system in Matsumoto City" published in March 2000 (page 37; the health survey results (3rd-7th)).

[6th checkup: March 1998, three years and eight months after the attack]

Date of implementation: March 19

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: Persons who exhibited abnormalities that appeared to be associated with sarin in previous medical checkups

Persons who were determined to require detailed examinations via the 6th questionnaire surveys in February 1998 (including persons who desired a medical checkup)

The number of subjects: 15

The number of persons who received a medical checkup: 10

The results: Grade A 6 persons

Grade B 1 person

Grade C 3 persons

Regarding detailed results, please refer to "Health crisis management system in Matsumoto City" published in March 2000 (page 37; the health survey results (3rd-7th)).

[7th checkup: March 1999, four years and eight months after the attack]

Date of implementation: March 11 and 12

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: Persons who exhibited abnormalities that appeared to be associated with sarin in previous medical checkups

Persons who were determined to require detailed examinations via the 7th questionnaire surveys in February 1999 (including persons who desired a medical checkup)

The number of subjects: 17

The number of persons who received a medical checkup: 15

The results: Grade A 8 persons

Grade B 1 person

Grade C 6 persons

Regarding detailed results, please refer to "Health crisis management system in Matsumoto City" published in March 2000 (page 37-38; the health survey results (3rd-7th)).

Regarding detailed ophthalmologic examinations, please refer to “Health crisis management system in Matsumoto City” published in March 2000 (page 42–51; the ophthalmologic examination after the exposure to sarin).

[8th checkup: June 1999, five years after the attack]

Date of implementation: June 16

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: Persons who exhibited abnormalities that appeared to be associated with sarin in previous medical checkups

Persons who were determined to require detailed examinations via the 7th questionnaire surveys in February 1999 (including persons who desired a medical checkup)

The number of subjects: 10

The number of persons who received a medical checkup: 2

The results: Grade A 1 person

Grade C 1 person

[9th checkup: February 2001, six years and seven months after the attack]

Date of implementation: February 19, March 9

Place: Shinshu University Hospital, outside Nagano Prefecture (Tokyo)

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: Persons who exhibited abnormalities that appeared to be associated with sarin in previous medical checkups

Persons who were determined to require detailed examinations via the 9th questionnaire surveys in February 1999

Persons who desired a medical checkup in the 9th questionnaire survey in February 1999

The number of subjects: 10

The number of persons who received a medical checkup: 7

The results: Grade A 4 persons

Grade C 2 persons

Unknown because of living outside the prefecture 1 person

[10th checkup: March 2002, seven years and eight months after the attack]

Schedule date of implementation: The medical checkup was scheduled in March. Although a notification was mailed to six persons who exhibited abnormalities that appeared to be associated with sarin, no person desired to receive a medical checkup.

[11th checkup: March 2003, eight years and eight months after the attack]

Date of implementation: March 14, April 11

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: Persons who exhibited abnormalities that appeared to be associated with sarin in previous medical checkups

Persons who desired a medical checkup in the 11th questionnaire survey in January–February 2003

The number of subjects: 7

The number of persons who received a medical checkup: 7

Only internal medical examination: 1 person, only ophthalmological examination: 1 person, internal medical examination + ophthalmological examination: 5 persons

The results: Grade A 5 persons

Grade C 2 persons (Arrhythmia. These persons have undeniable possibilities of PTSD)

[12th checkup: February 2004, nine years and seven months after the attack]

Date of implementation: February 12

Place: Shinshu University Hospital, outside Nagano Prefecture (Osaka)

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations, psychiatric examinations

Subjects: Persons who exhibited abnormalities that appeared to be associated with sarin in previous medical checkups

Persons who desired a medical checkup in the 12th (final) questionnaire survey in November–December 2003

The number of subjects: 21

The number of persons who received a medical checkup: 18 (The results in 1 person living outside the prefecture were unknown)

Only internal medical examination: 2 persons, only psychiatric examination: 2 persons, only ophthalmologic examination: 5 persons, internal medical examination + ophthalmologic examination + psychiatric examination: 3 persons, internal medical examination + ophthalmologic examination: 4 persons, ophthalmologic examination + psychiatric examination: 1 person

The results: Grade A 12 persons

Grade B 4 persons

Grade C 1 person (This person has undeniable possibilities of PTSD)

[13th checkup: February 2006, eleven years and seven months after the attack]

Date of implementation: February 16

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: The medical checkups for the victims of the sarin attack were announced in “Public Relations Magazine Matsumoto” to identify the persons who desired a medical checkup.

The number of subjects: 2

The number of persons who received a medical checkup: 1

Internal medical examination + ophthalmological examination: 1 person

The results: Grade A 1 person

[14th checkup: March 2007, twelve years and eight months after the attack]

Date of implementation: March 27

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, psychiatric examinations

Subjects: The medical checkups for the victims of the sarin attack were announced in “Public Relations Magazine Matsumoto” to identify the persons who desired a medical checkup.

The number of subjects: 1

The number of persons who received a medical checkup: 1

Internal medical examination + ophthalmological examination: 1

person

The results: Grade A 1 person

[15th checkup: January 2008, thirteen years and six months after the attack]

Date of implementation: January 17, February 18 (electroencephalography)

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: The medical checkups for the victims of the sarin attack were announced in “Public Relations Magazine Matsumoto” to identify the persons who desired a medical checkup.

The number of subjects: 2

The number of persons who received a medical checkup: 2

Internal medical examination + ophthalmological examination: 2

persons

The results: Grade A 1 person

Grade C 1 person (Mild peripheral neuropathy persisted without abnormality in electroencephalogram)

[16th checkup: February 2009, fourteen years and seven months after the attack]

Date of implementation: February 5

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: The medical checkups for the victims of the sarin attack were announced in “Public Relations Magazine Matsumoto” to identify the persons who desired a medical checkup.

The number of subjects: 2

Internal medical examination + ophthalmological examination: 2 persons

The number of persons who received a medical checkup: 2

The results: Grade A 1 person

Grade C 1 person (The peripheral neuropathy remained and the ophthalmological examination revealed slight concentric constriction of the visual field)

[17th checkup: March 2010, fifteen years and eight months after the attack]

Scheduled date of implementation: Although it was scheduled in March and was announced in “Public Relations Magazine Matsumoto,” no person desired a medical checkup.

[18th checkup: March 2011, sixteen years and eight months after the attack]

Date of implementation: March 3

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations, ophthalmological examinations

Subjects: The medical checkups for the victims of the sarin attack were announced in “Public Relations Magazine Matsumoto” to identify the persons who desired a medical checkup.

The number of subjects: 1

The number of persons who received a medical checkup: 1

Internal medical examination + ophthalmological examination: 1 person

The results: Grade A 1 person (Mild senile cataract)

[19th checkup: March 2012, seventeen years and eight months after the attack]

Scheduled date of implementation: Although it was scheduled in March and was announced in “Public Relations Magazine Matsumoto,” no person desired a medical checkup.

[20th checkup: March 2013, eighteen years and eight months after the attack]

Scheduled date of implementation: Although it was scheduled in March and was announced in “Public Relations Magazine Matsumoto,” no person desired a medical checkup.

[21st checkup: March 2014, nineteen years and eight months after the attack]

Scheduled date of implementation: Although it was scheduled in March and was announced in “Public Relations Magazine Matsumoto,” no person desired a medical checkup.

[22nd checkup: August 2014, twenty years and one month after the attack]

Date of implementation: August 6

Place: Shinshu University Hospital

Contents: History taking, internal medical examinations, neurological examinations

Subjects: Persons who were victims of the sarin attack and desired to receive a medical checkup

The number of subjects: 1

Only internal medical examination: 1 person

The number of persons who received a medical checkup: 1

The results: Grade C 1 person (Sensory disorder predominating in the distal lower extremities and reduction in conduction velocity of the distal regions of the tibial nerves and sensory nerves.)

Summary of 20-year medical checkup

Hiroshi Morita

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(at the time, Assistant in the Third Department of Internal Medicine, Shinshu University School of Medicine)

Facing an unprecedented attack, Matsumoto City worked to grasp the whole situation in the afflicted areas and continued health surveys through activities by the Council of Regional Medical Care Countermeasure. The Shinshu University Hospital cooperated with these activities from the outset. During this period, they conducted large-scale epidemiological surveys using questionnaires, immediately after the attack and at 3 and 10 years after the attack. Since the response and collection rates decreased over time, the surveys ceased at 10 years after the attack. Questionnaires were conducted through the efforts of Dr. Tamie Nasu, and the pertinent details have been presented in two previously published reports. In this report, the details of the large-scale surveys conducted 10 years after the attack are presented.

During the initial post-attack period, in addition to the detailed questionnaires for victims, we also conducted mass medical checkups for residents living in the afflicted areas, including measurements of blood acetylcholinesterase activity, an objective index measuring sarin exposure. We also collected medical care data for all victims who consulted and received treatment at medical facilities. This information was published in March of the year following the attack. The surveys conducted during this initial stage were extremely detailed in order to fully grasp the whole situation in the afflicted areas. Based on these initial surveys, we were able to identify important points from the outset that victims with severe symptoms and mild symptoms should not be treated on the same basis, and that the presence or absence of prolonged aftereffects in victims with severe symptoms should be understood. In addition, although the concept of PTSD was not very prevalent during the initial post-attack period, we attached importance to developing a system that did not trigger excessive anxiety in afflicted areas by providing appropriate information. These matters are detailed in the two reports published by Matsumoto City and the Matsumoto City Council of Community-Based Integrated Care.

Regarding victims with severe symptoms who were diagnosed as having some remaining physical disorders after the acute stage, as well as the residents who desired to receive subsequent medical checkups up to the last fiscal year, the health surveys were continued until disappearance of abnormalities. As the results, it was confirmed that, aside from one victim, the abnormalities disappeared in all others who could be followed up continuously. We conducted these medical checkups 21 times. Among the victims who had some complaints during the medical checkups, persons who did not have severe symptoms at the time of the attack were considered to have no objective symptoms associated with sarin.

Persistent disorders in victims with severe symptoms

Persistent objective symptoms were arrhythmia (one case) and electroencephalogram abnormalities (four cases). Those victims had no subjective symptoms and those objective symptoms disappeared during a long-term follow-up.

Among 12 victims with severe symptoms, three victims presented convulsions during the acute stage. However, subsequent surveys revealed that only one of these three victims presented persistent electroencephalogram abnormalities. Electroencephalogram abnormalities were detected in three other victims, all of whom normalized within 10 years. Although long-term administration of anti-epilepsy drug was not performed in these patients, subsequent convulsions did not occur (Table).

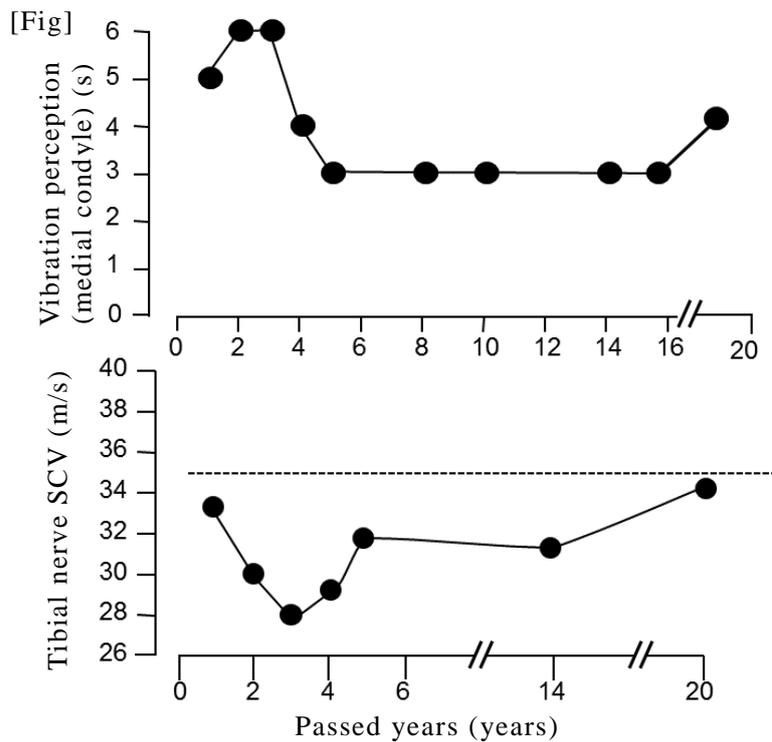
[Table]

	Conditions during the acute stage				Electroencephalogram abnormalities	
	ChE%*	Impaired consciousness	Convulsions	Artificial respiration	Abnormal findings	Persisting duration
1	19%	Severe	(+)	(+)	sharp wave	4 years
2	12%	Mild	(-)	(-)	δ burst	6 years
3	21%	Mild	(-)	(-)	δ burst	2 years
4	12%	Moderate	(-)	(-)	positive spike	1 year

* ChE%: (pseudo)cholinesterase activity at admission on the day of the attack (% of normal lower limit at respective hospital)

Although the symptoms associated with local exposure, such as discharges from the eyes and nose, were widely observed at the acute stage, surveys investigating subjective symptoms at the acute stage revealed that palsy in the extremities was noticed in 34% of inpatients, 6% of outpatients, and only 0.7% of the victims who had no consultation with a doctor but had some subjective symptoms. In addition, it was known that attention must be paid to organophosphate-induced delayed polyneuropathy (OPIDN) in subsequent health surveys. However, blood sarin exposure level, but not local sarin exposure level, is an important factor for this disorders, and they were judged to have only occurred in victims presenting severe symptoms during the acute stage. Thus, we continued the medical checkups, including nerve conduction tests, especially paying attention to peripheral nerve disorder (OPIDN) associated with sarin in victims presenting severe symptoms and showing objective signs of peripheral nerve disorder in vibration perception tests during the acute stage survey.

Regarding the results, one victim presented subjective palsy and a reduction in vibration perception and nerve conduction function (Fig). Vibration perception in the distal lower extremities (medial condyle) progressively decreased until 5 years after the attack, subsequently remained unchanged for a prolonged period of time, then improved to mild severity at 20 years after the attack. Sensory nerve conduction velocity (SCV) of the tibial nerve at the distal lower extremities (medial condyle-3rd interdigital site) was the lowest at 3 years after the attack, and although it showed a trend toward improvement, mild abnormality still remained 20 years after the attack. This indicates that OPIDN persists for a long time in some victims initially presenting severe symptoms.



As described above, the Matsumoto City Council of Community-Based Integrated Care conducted large-scale medical surveys over 20 years using questionnaires and implemented individual medical checkups in victims with severe symptoms as well as those who requested them. The collection rate of the large-scale health surveys gradually decreased over time, and the number of individuals desiring the medical checkup was minimal in 10 years or more post attack. Regarding these results, objective physical aftereffects have persisted thus far in only one patient, who presented a case of peripheral nerve disorder.

Acknowledgement

We deeply thank Dr. Nobuo Yanagisawa (at present, President of the All Japan Labor Welfare Foundation) who directed the medical checkups for the victims, Yoshiki Sekijima (at present, Associate Professor of the Third Department of Internal Medicine of the Shinshu University School of Medicine), Hiroyuki Yahikozawa (at present, Director of the Department of Neurology, Japanese Red Cross Society Nagano Hospital), Masashi Yamazaki (at present, Director of the Department of Neurology, Hokushin General Hospital), Jun Miki (Director of the Department of Neurology, Saku Central Hospital), Masahiko Nohara (at present, Director of the Department of Ophthalmology, Maruko Central Hospital), Naoji Amano (at present, Director of the Okaya City Hospital), Nobuo Tatsumi (previously,

Assistant Professor of the Department of Psychiatry, Shinshu University School of Medicine), Shin Inuzuka (at present, Vice-director of the Nagano Prefectural Mental Wellness Center - Koamagane) for their cooperation.

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6. Funds for health management of victims of the Matsumoto

Sarin Attack etc.

6. Funds for health management of victims of the Matsumoto Sarin Attack, etc.

Fiscal year	Donations				Funds	Projects with funding				Remaining amount (A-B) C
	Date	Donor	Donation	Total amount		Fiscal year	Project contents	Expenditure B	Total amount	
1995	3.8	Individual (one person)	3,000,000	3,000,000	3,000,000					3,000,000
1996	5.25	Individual (one person)	1,000,000	4,000,000	5,521,020	1996	(1) Supply condolence money to bereaved families of dead victims (2) Supply consolation payment to severely affected victims (3) Expenses for commission of the 5th health survey	1,400,000	2,650,000	2,871,020
	7.29	Individual (one person)	1,000,000	5,000,000				600,000		
	9.29	Seiko Labor Union Seiko Epson Branch Office	200,000	5,200,000				650,000		
	12.26	Strategy committee for preventing Aum Shinrikyo from invading Matsumoto	311,020	5,511,020						
	1.28	Individual (one person)	10,000	5,521,020						
		Subtotal	2,521,020					Total 2,650,000		
1997		(deposit interest)	20,736	5,541,756	2,891,756	1997	(1) Supply consolation payment to severely affected victims (2) Expenses for commission of the 6th health survey	200,000 680,000	3,530,000	2,011,756
1998	3.26	Individual (one person)	200,000	5,741,756	2,220,307	1998	(1) Supply of consolation payment to severely affected victims (2) Expenses for commission of the 7th health survey	200,000	4,410,000	1,340,307
		(deposit interest)	8,551	5,750,307				680,000		
		Subtotal	208,551					Total 880,000		
1999	4.16	Individual (one person)	220,000	5,970,307	1,798,946	1999	(1) Supply consolation payment to severely affected victims (2) Expenses for commission of the 8th health survey	200,000	4,980,000	1,228,946
	5.25	(deposit interest)	697	5,971,004				370,000		
	7.5 - 8.24	Audience of TV program "The wide" (Nippon Television) (17 people)	186,000	6,157,004						
	11.25	(deposit interest)	1,149	6,158,153						
	1.18	Individual (one person)	50,000	6,208,153						
	3.24	(deposit interest)	793	6,208,946						
		Subtotal	458,639					Total 570,000		
2000	5.26	(deposit interest)	2,116	6,211,062	1,470,965	2000	(1) Supply consolation payment to severely affected victims (2) Expenses for commission of the 9th health survey	200,000	5,230,000	1,220,965
	6.2	Miyashige of shrine/ritual articles	30,000	6,241,062				50,000		
	12.28	Anonymous	100,000	6,341,062						
	2.23	Executive committee for making the movie, "Darkness in The Light"	108,318	6,449,380						
	3.26	(deposit interest)	1,585	6,450,965						
		Subtotal	242,019					Total 250,000		
2001	5.28	(deposit interest)	723	6,451,688	1,224,426	2001	(1) Supply consolation payment to severely affected victims	200,000	5,430,000	1,024,426
	11.28	(deposit interest)	2,378	6,454,066						
	3.12	(deposit interest)	360	6,454,426						
		Subtotal	3,461					Total 200,000		
2002	7.2	Individual (one person)	20,000	6,474,426	1,045,266	2002	(1) Supply consolation payment to severely affected victims (2) Expenses for commission of the 11th health survey	200,000	5,690,000	785,266
	10.29	(deposit interest)	388	6,474,814				60,000		
	3.14	(deposit interest)	452	6,475,266						
		Subtotal	20,840					Total 260,000		
2003	6.6	Individual (one person)	30,000	6,505,266	815,630	2003	(1) Supply consolation payment to severely affected victims (2) Expenses for commission of the 12th health survey	200,000	5,950,000	555,630
	5.27	(deposit interest)	148	6,505,414				60,000		
	10.2	(deposit interest)	146	6,505,560						
		(deposit interest)	70	6,505,630						
		Subtotal	30,364					Total 260,000		
2004	6.8	Individual (one person)	30,000	6,535,630	586,192	2004			0	586,192
		(deposit interest)	562	6,536,192						
		Subtotal	30,562					Total 0		
2005	6.13	Individual (one person)	30,000	6,566,192	616,951	2005	Expenses for commission of the 13th health survey	14,144	5,964,144	602,807
		(deposit interest)	759	6,566,951						
		Subtotal	30,759					Total 14,144		

Donations					Funds	Projects with funding				Remaining funds (A-B) C
Fiscal year	Date	Donor	Donation	Total amount	Reserved amount A	Fiscal year	Project contents	Expenditure B	Total amount	
2006	6.6	Individual (one person)	30,000	6,596,951	634,432	2006	Expenses for commission of the 14th health survey	4,200	5,968,344	630,232
		(deposit interest)	1,625	6,598,576						
		Subtotal	31,625							
2007	4.5	Individual (one person)	30,000	6,628,576	664,074	2007	Expenses for commission of the 15th health survey	45,419	6,013,763	618,655
		(deposit interest)	3,842	6,632,418						
		Subtotal	33,842							
2008	5.27	Individual (one person)	30,000	6,662,418	652,435	2008	(1) Condolence money (2) Expenses for commission of the 16th health survey	200,000	6,248,629	417,569
		(deposit interest)	3,780	6,666,198				34,866		
		Subtotal	33,780							
2009	6.17	Individual (one person)	30,000	6,696,198	451,149	2009			6,248,629	451,149
		(deposit interest)	3,580	6,699,778						
		Total	33,580							
2010	6.17	Individual (one person)	30,000	6,729,778	485,209	2010	Expenses for commission of the 18th health survey	28,850	6,277,479	456,359
		(deposit interest)	4,060	6,733,838						
		Total	34,060							
2011				6,733,838	460,136	2011			6,277,479	460,136
		(deposit interest)	3,777	6,737,615						
		Total	3,777							
2012				6,737,615	463,249	2012			6,277,479	463,249
		(deposit interest)	3,113	6,740,728						
		Total	3,113							
2013				6,740,728	466,451	2013			6,277,479	466,451
		(deposit interest)	3,202	6,743,930						
		Total	3,202							
2014	3.25	Individual (one person)	30,000	6,773,930	499,669	2014	Expenses for commission of the 22nd health survey	17,409	6,294,888	482,260
		(deposit interest)	3,218	6,777,148						
		Total	33,218							
2015		(deposit interest)	2,213	6,779,361	484,473				6,294,888	484,473
		Total	2,213							

7. Documents

Request for cooperation with questionnaire
Questionnaire on health
Medical checkup for toxic gas poisoning in Matsumoto City: Checkup sheet
Public Lecture Flyer
Lecture Meeting Flyer
Report on surveys of the toxic gas poisoning in Matsumoto City (cover only)
Health crisis management system in Matsumoto City (cover only)
Advances over thirty years (cover only)
Ordinance of Fund for Health Management of Victims of the Matsumoto Sarin Attack etc.
Matsumoto City Council of Community-Based Integrated Care: Council regulations
List of affiliated bodies and board members of the Matsumoto City Council of
Community-Based Integrated Care

November 18, 2003

Request for cooperation with questionnaire

Next year, it will be 10 years since the Matsumoto sarin attack. The survey conducted 5 years ago revealed that there were still many victims who complained of abnormalities in the eyes and body. However, it has not been clarified as to how long these abnormalities would persist. This survey intends to elucidate this point and help your health management.

Whether or not to participate in this survey is completely up to you. If you choose not to participate, it will not put you at a disadvantage. Even after consenting, you can withdraw anytime.

The responses of this survey will be analyzed anonymously. Your personal information will not be exposed or revealed at all.

To increase the accuracy and reliability of the results, we request that as many people as possible participate in this survey. We also invite people who were not affected by the sarin attack to participate in this survey.

We would appreciate it if you would participate in this survey after understanding the purpose of the survey.

Yasuhei Niwa

Chair of the Matsumoto City Council of Community-Based Integrated Care

Tadashi Aruga

Mayor of Matsumoto City

(In charge: Health Section, Health and Welfare Department)

- Please place the completed questionnaire sheet in the envelope distributed alongside it and submit it after sealing the envelope.
- Submission dead line date is **December 3**. Please submit to the heads of neighborhood associations through the heads of the neighborhood groups.

In charge: Health Section, Health and Welfare Department, Matsumoto City Government

Tel (direct): 34-3217

Questionnaire on health

To: Matsumoto City Council of Community-Based Integrated Care

Do you consent to participating in this survey?

- Yes • No

Name _____ Age _____ years Sex _____ • male • female _____

Address _____ Tel _____

Survey result analysis will be conducted on an anonymous basis and personal information will not be leaked in any capacity.

Mark any relevant answer with a circle.

1. Did you live at your current address at the time of the sarin attack?

- 1) Yes (Proceed to question 2)
 2) No (Proceed to question 4)

2. Did you have any symptoms induced by exposure to sarin?

- 1) Yes
 2) No

3. For individuals answering “Yes” for question 2, how did you respond regarding seeking medical treatment?

- 1) I was hospitalized.
 2) I visited hospital/clinic as an outpatient.
 3) I was not hospitalized or did not visit hospital/clinic.

4. How is your current health condition? Please select the degree of applicability of the following conditions on a scale of 0-4, and mark your selection with a circle.

No	Symptoms	0 None	1 light	2 Intermediate	3 Considerable	4 Extremely	Other (please write additional comments)
1	Physical fatigue						
2	Getting tired easily						
3	Susceptibility to cold						
4	Ease of developing low fever						
5	Difficulty breathing						
6	Chest tightnung						

7	Sudden racing pulse						
8	Nausea						
9	Susceptibility to diarrhea						
10	Stomachache						
11	Decreased appetite						
12	Dizziness						
13	Headache						
	Ocular symptoms						
14	Easily fatigued in the eyes						
15	Clouded vision						
16	Near-sightedness						
17	Far-sightedness						
18	Loss of ocular focus						
19	Ocular discharge						
20	Ocular sensation of a foreign body						
21	Others ()						
22	Sleeplessness						
23	Having nightmares						
24	Flashbacks to the sarin attack						
25	Fear when approaching the sarin attack						
26	Strong fear						
27	Unease and frustration						
28	Lack of concentration, frequent errors						
29	Avoidance of sarin attack-related news						
30	Apathy						
31	Poor memory						
32	Loss of mental toughness, becoming						
33	Physical tension (such as shoulder stiffness and sweaty hands)						

Please fill in the reverse side.

5. How is your mental health condition? Please select the degree that you have encountered the following conditions during this week, on a scale of 0-4, and mark your selection with a circle.

	Mental conditions for this week	0 None	1 light	2 Intermediate	3 Considerable	4 Extremely
1	Memories of the attack trigger emotional response at the time of the attack					
2	Having trouble staying asleep					
3	Lingering memories of the attack while performing other tasks.					
4	Impatience/Irritability					
5	Whenever I remember the attack, I try to re-collect myself.					
6	Thinking of the attack involuntarily.					
7	I feel that the attack did not actually happen or was not real.					
8	I avoid anything that triggers memories of the attack.					
9	Sudden recollection of the attack scene.					
10	Become highly sensitive					
11	I try not to think about the attack.					
12	I try not to talk about it.					
13	My emotion about the attack seems to become numb.					
14	I involuntarily and suddenly return to the scene of the attack and behave accordingly					
15	Falling asleep is not easy.					
16	I sometimes become emotionally intense regarding the attack.					
17	I try to forget the attack.					
18	I cannot concentrate on things.					
19	Whenever I remember the attack, I start sweating and have difficulty breathing, nausea, and a thumping heart rate.					
20	I dream of the attack.					
21	I feel more cautious.					
22	I make efforts not to talk about the attack.					

6. How is your health condition? If you have to date been treated for any disease after the sarin attacks, please mark it with circle. You can choose multiple answers.

- 1) Hypertension 2) Hepatic diseases 3) Cardiac diseases 4) Renal diseases
- 6) Pulmonary diseases 7) Asthma 8) Diabetes 9) Uterine/ovarian diseases
- 10) Ocular diseases 11) Diseases of the ear/nose 12) Diseases of the blood (such as anemia)
- 13) Orthopedic diseases or injuries (such as lumber pain and joint pain)
- 14) Allergy (such as pollen allergy)
- 15) Diseases of autonomic nerve (such as depression and neurotic diseases)
- 18) Endocrine diseases (such as Basedow's disease)
- 19) Metabolic diseases (such as hypercholesteremia, hyperuricemia, and hyperlipidemia)
- 20) Cancers, malignant diseases (Which site?)
- 21) Others ()

The following questions apply only to women.

7. Did you experience a change in menstruation after the sarin attack?

- 1) Yes (Please write specifically)
- 2) No

8. Did you become pregnant after the sarin attack?

- 1) Yes
- 2) No

9. Did you deliver after the sarin attack?

- 1) Yes
- 2) No

10. During pregnancy or delivery, did you or your baby have any abnormalities?

- 1) Yes (Please write specifically)
- 2) No

Thank you very much for your cooperation.

Subsequently, we plan to conduct medical checkups in internal medicine, ophthalmology, and psychiatry in cooperation with the Shinshu University. Thus, if you have any concerns or want to be examined, please receive the medical checkups. In addition, we will contact any person who desires to receive the checkup.

Medical checkup

1 Desire

2 Not desire

- Internal medicine + ophthalmology + psychiatry
- Internal medicine + ophthalmology
- Only psychiatry

Please write any additional comments you may have below.

()

Public lecture

Consideration the Response to Citizens' Health Crises

□ We will hold a public lecture where we will discuss how to respond to health crises accompanying emergencies, such as the mass disaster of the Matsumoto sarin attack. □



● **Keynote Lecture: “Knowledge for conquering crises created by the citizens”**
by Mr. Yogo Isogai (Director, TV Asahi Corporation)

– Validation with actual cases: What can we learn from the Matsumoto/Tokyo subway sarin attack, Wakayama curry case, countermeasures against Aum Shinrikyo –

Serious incidences, accidents, or disasters, which may occur unexpectedly and suddenly, cause unspeakably tragedies to the citizens.

I have gathered information about various tragedies in Matsumoto, Kobe, Tokyo, and Wakayama and always considered what the national government, public administration, media, and the citizens must prepare for and protect to prevent calamities from expanding further. In addition, I have considered what we should talk about to the victims and what we should do for the victims.

I consider the most necessary thing is that the citizens themselves consider what they can do and take it a step at a time.



● **Panel discussion**
Moderator: Shinsuke Kimura (lawyer)

- History of additional post:
Board member of Nippon Association of Consumer Specialists
Representative of Japan Cambodia Lawyer Society
Representative of People's Forum on Cambodia, Japan
Specialized staff for the special consultation project for preventing bankruptcies by Tokyo Chamber of Commerce and Industry

Panelists:

- Tadashi Aruga, Mayor of Matsumoto City
- Nobuo Yanagisawa, Director of National Institute for Longevity Science, Chubu National Hospital
- Sadayoshi Kubota, Chair of Matsumoto City Medical Association
- Hiroshi Okudera, Vice-Director of Department of Emergency and Clinical Care, Shinshu University Hospital
- Mikio Shimizu, Director of Department of Emergency, Nagano Prefectural Cancer Detection and Emergency Care Center
- Yogo Isogai (advisor), Director of TV Asahi Corporation



Please feel free to join the meeting.

Date and time:

October 7 (Saturday),

13:15–16:30 (Open: 12:45)

Place

Nagano Prefectural Matsumoto Culture Hall

(Middle Hall)

General Information about Lecture Meeting

Again Learning Importance of Lives 10 Years After the Matsumoto Sarin Attack

Date and time: **June 26**, 2004 (Saturday), **13:00 – 15:15**

Place: 6F Hall, M-Wing (Matsumoto City Community Center) (admission free)

Program

- Greeting..... ● 13:00
Akira Shugaya, Mayor of Matsumoto City
Yasuhei Niwa, Chair of Matsumoto City Council of
Community-Based Integrated Care
- Concert..... ● 13:15 – 13:45
Flute performance: Katsura sisters (Ayako & Satoko)
- Lecture ● 13:50 – 15:15
Yoko Miyakoshi: "Life: Until the battery runs out – My
daughter who has lived with the disease optimistically
and to the best of her ability –"

Profile of Mrs. Yoko Miyakoshi

She lives in Fujimi Town, Suwa-gun.

Representative of "Shinshu Suzuran group", which supports classes inside the Nagano Children's Hospital.

Mother of Yukina Miyakoshi who had the onset of the disease at age five and died at age eleven.

A poem titled "Life" that was written by Yukina Miyakoshi was made into a TV drama titled "Until the battery runs out" and aired on TV.

Book: "Until the battery runs out" edited by the Suzuran group

Organized by:

Matsumoto City, Matsumoto City Council of Community-Based Integrated Care

(Contact: Health Section, Health and Welfare Department, Matsumoto City Tel.: 34-3217 Fax: 34-3204)

● General information

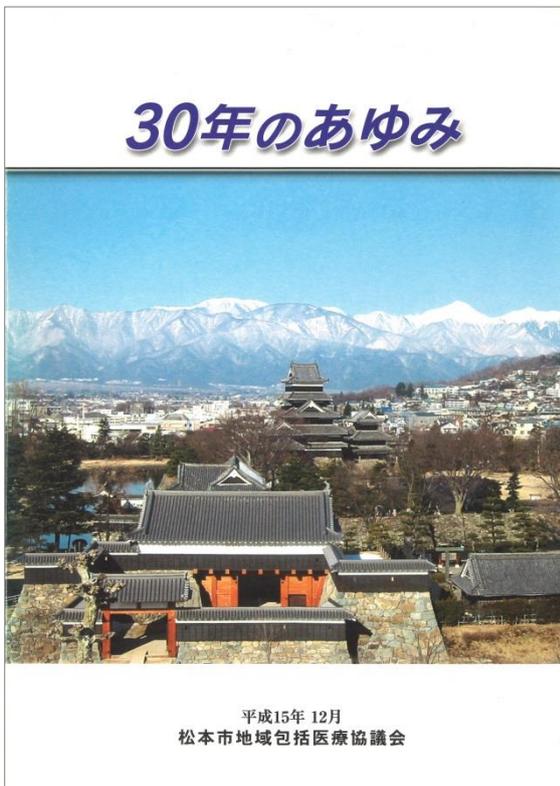
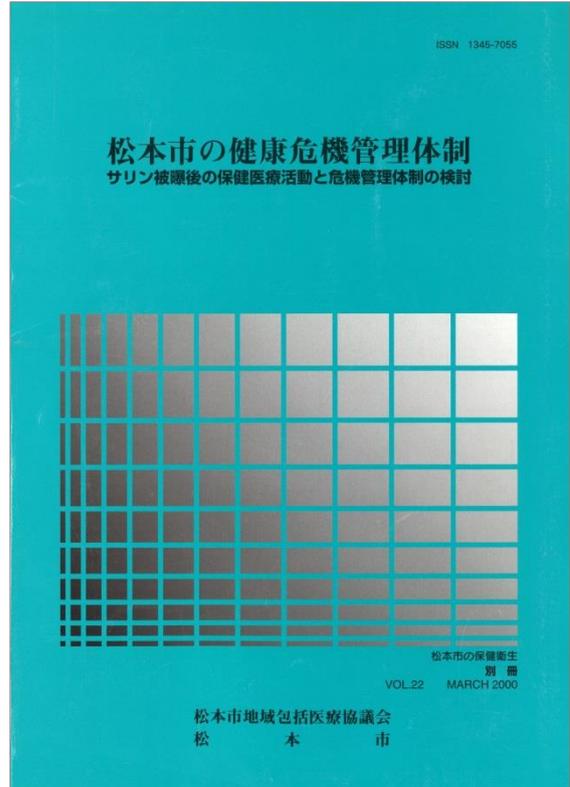
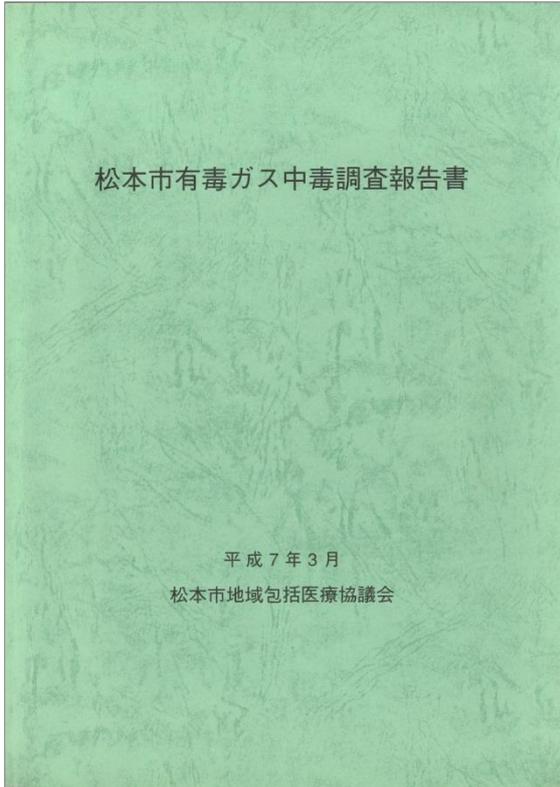
The fifth Clock Festival will be held in the fifth year since the opening of the M-Wing.
Please come.

● Date and time: June 26 (Saturday) - 27 (Sunday)

● Place: M-Wing and Isemachi-dori Street

● Contents: Presentations at the community hall (exhibition and performance), women's center festival (mini concert), the first district welfare plaza festival (exhibition of activities), children's plaza, tea drinking, bazaar, and ice carving

Booklets published by the Matsumoto City Council of Community-Based Integrated Care
after the Matsumoto sarin attack



[Upper left]
Report on surveys of the toxic gas poisoning in Matsumoto City
(March, 1995)

[Upper right]
Health crisis management system in Matsumoto City
(March, 2000)

[left below]
Advances over thirty years (December, 2003)

○ Ordinance of Fund for Health Management of Victims of the Matsumoto Sarin Attack etc.

June 27, 1996

Ordinance No. 25

Revisions: September 30, 1996: Ordinance No. 45

March 15, 2002: Ordinance No. 12

(Purpose)

Article 1: This ordinance intends to establish the Fund for Health Management of Victims of the Matsumoto Sarin Attack etc. (hereinafter referred to as “the Fund”) for conducting health management of the residents affected by the Matsumoto sarin attack etc. (hereinafter referred to as “the victims”), based on the regulations of Article 241, Paragraph 1 of the Local Autonomy Act (Law No. 67 of 1947).

(Fund reserves)

Article 2: Fund reserves shall consist of the following:

- (i) Money contributed for the purpose of saving the victims
- (ii) Provisions from the general account

(Management)

Article 3: Money belonging to the Fund must be stored by deposit in financial institutions or other methods deemed most secure and advantageous.

- (2) Money belonging to the Fund may be replaced by the most secure and advantageous marketable securities when necessary.

(Exchange operation)

Article 4: The mayor can establish a secure carryback method, period, and interest rate when required financially, and execute them by exchanging the money belonging to the Fund with that of the annual budget account.

(Processing of investment profits)

Article 5: Profits from the Fund operations shall be earmarked for the revenue and expenditure budget of the general account.

(Disposition)

Article 6: The mayor can terminate the Fund in cases where the following projects are conducted.

- (i) A project that is related to the health management of the victims
- (ii) Providing condolence money for the bereaved families of residents killed in the Matsumoto saline attack etc. and providing compensation payments for victims suffering notable physical and/or mental impairments.
- (iii) Other than the aforementioned (i) and (ii), incidents and matters where the mayor recognizes a special need.

(Commission)

Article 7: Apart from those declared in this ordinance, the mayor shall establish necessary items related to the management of the Fund.

Supplementary provision

This ordinance shall be enforced from the day of publication.

Supplementary provision (September 30, 1996 Ordinance No. 45)

This ordinance shall be enforced from the day of publication.

Supplementary provision (March 15, 2002 Ordinance No. 12)

This ordinance shall be enforced from April 1, 2002.

Purpose	Article	1	The purpose is to closely work with related organizations and groups to enrich and arrange the community-based integrated care, such as health promotion of the citizens, epidemic prevention, systems of medical care/welfare, and to develop efficient activities.
Name	Article	2	The name of the council is Matsumoto City Council of Community-Based Integrated Care.
Project	Article	3	The following projects will be implemented: The council is a consultation organization in Matsumoto City, which contributes to planning and promoting health/medical care in Nagano Prefecture.
		2	The council promotes projects, such as the arrangement of medical care supply systems for emergencies, protection of the citizens, and
		3	The council also contributes matters that are necessary to achieve
Organizational structure	Article	4	The council comprises representatives from administrative relations, various groups related to medical care, and groups related to the
Board members	Article	5	The council is operated by the following board members: Chair 1 person Vice-Chair 2 people Executive board member Several people Secretary Several people Auditor 2 people
		2	Advisors can be included in the council.
Term	Article	6	There is a two-year term for board members, and reappointment is
Operation	Article	7	The council meetings are held twice a year. However, when necessary, additional meetings will be held. The Chair leads the council. A board of secretaries is established for operating and promoting the council. The board is operated by working-level staffs from the organizational groups.
		8	The secretariat is at the Matsumoto City Medical Association.
Expenses	Article	9	Necessary expenses for operating the council are provided by contributions, subsidies, and other income.
		2	The amount of the contribution is prescribed separately.
Fiscal year	Article	10	The fiscal year of this council is from April 1 to March 31.
		Additional clause	Other necessary items will be prescribed separately.

List of affiliated bodies and board members of the Matsumoto City Council of Community-Based Integrated Care

July 15, 2015

Title	Organization name/title	Name
Advisory	Mayor of Matsumoto City	Akira Sugenoya
"	Director of Matsumoto Welfare and Public Health Center	Hiroshi Toriumi
"	Director of Shinshu University Hospital	Kazuhiro Hongo
Chair	Chair of Matsumoto City Medical Association	Eiji Momose
Vice-Chair	Deputy Director of Matsumoto Welfare and Public Health Center	Hideo Muramatsu
"	Director of Health and Welfare Department, Matsumoto City	Takashi Maruyama
Executive board member	President of Matsumoto Chamber of Commerce and Industry	Tamotsu Inoue
"	Representative Director and Union President of JA Matsumoto High-Land	Shigeru Ito
"	Director of General Affairs and Planning Department, JA Matsumoto High-Land	Yoshihisa Kubota
"	Chief Inspector of Second Section, Matsumoto Labor Standards Inspection Office	Takuya Soejima
"	Vice-Chair of Matsumoto City Medical Association	Atsushi Sugiyama
"	Vice-Chair of Matsumoto City Medical Association	Junichiro Yamagishi
"	Chair of Matsumoto City Dental Association	Satoshi Takebuchi
"	Executive Director of Matsumoto City Dental Association	Tatsuto Okubo
"	Chair of Matsumoto Pharmaceutical Association	Hideki Kagami
"	Executive Director of Matsumoto Pharmaceutical Association	Kensuke Tatai
"	Chief of Nagano Dietetic Association Chushin Branch	Kouji Kamijo
"	Chief of Nagano Nursing Association Matsumoto Branch	Yumiko Kato
Auditor	Secretary-General of Matsumoto Pharmaceutical Association	Toshikiyo Nasuno
"	Chief of the Welfare and Culture Section, General Affairs and Planning Department, JA Matsumoto High-Land	Kenichi Yamazaki
Secretary	Board Member of Matsumoto City Medical Association	Toru Hanaoka
"	Chief of the Health Promotion Support Division, Matsumoto Welfare and Public Health Center	Atsuko Kamijo
"	Chief of the Insurance Section, Health and Welfare Department, Matsumoto City	Masahiro Tsukada
"	Chief of the Medical Affairs Section, Health and Welfare Department, Matsumoto City	Makoto Nakamura
"	Chief of the Health Promotion Section, Health and Welfare Department, Matsumoto City	Takako Furuhashi
"	Deputy Secretary-General of Matsumoto City Dental Association	Yasunori Takei
"	Head of the Members and Mutual Aid and Public Relations Group, Management Section, Matsumoto Chamber of Commerce and Industry	Yumiko Oguchi

(Secretariat)

"	Assistant Chief of the Insurance Section, Health and Welfare Department, Matsumoto City	Eiko Nakamura
"	Assistant Manager of the Medical Affairs Section, Health and Welfare Department, Matsumoto City	Hiroyuki Toyohara
"	Assistant Chief of the Health Promotion Section, Health and Welfare Department, Matsumoto City	Yuko Hayashi
"	Assistant Manager of the Health Promotion Section, Health and Welfare Department, Matsumoto City	Shoichi Tanaka
"	Secretary-General of Matsumoto City Medical Association	Kenji Furihata
"	Chief Engineer of Matsumoto City Medical Association Medical Center	Masako Aoki
"	Deputy Director of Secretariat, Matsumoto City Medical Association	Takuya Oguchi

Concluding remarks

Toru Hanaoka

Director-General of the Matsumoto City Council of Community-Based Integrated Care

This is the third report regarding the health survey of victims of the Matsumoto sarin attack. The first report was published on March 20, 1995, 9 months after the attack on June 27, 1994, and was titled “Report on surveys of the toxic gas poisoning in Matsumoto City.” The second report was published in March 2000, 5 years after the attack, and intended to establish a crisis management system in the area based on health survey results over the previous 5 years. This report was titled “Health crisis management system in Matsumoto City -a study on health and medical actions and crisis management system after sarin exposure-”.

Although we continued to conduct subsequent health surveys and medical checkups for victims, the completion of surveying was decided at the general meeting of the Council in 2004, 10 years after the attack. Although medical checkups were conducted every year for persons who desired it, as well as those who had health abnormalities after the attack, no individual had requested a medical checkup in 2010, 15 years after the attack, owing to affected residents leaving the area or aging.

Thus, we decided at the general meeting of the Council in 2013 to complete the health survey project for the victims of the Matsumoto sarin attack on condition that data of the health surveys and the medical checkups are summarized in three reports and that the medical checkup system is maintained so that it could be implemented anytime if someone requested it. The passage of time gradually reduced the memories of the heinous attack from the minds of the people and eventually seemed to wipe away them. I consider now that mission of those who were involved in related matters after the attack is to pass these facts down the generations in order to prevent the occurrence of such affairs again.

We deeply thank members of the “Health Survey Committee,” the expert committee of the Council, for their best efforts regarding the surveys and medical checkups, as well as other persons for their support regarding financial activities and activities in the afflicted areas.

On a final note, we hope from the heart that the victims will recover physically and mentally.

Report on Health Surveys of Victims of the Matsumoto Sarin Attack

Published in October 2015

Published by **Matsumoto City Council of Community-Based Integrated Care**

2-2-7 Jousei, Matsumoto City (Inside the Matsumoto City Medical Association)

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Matsumoto City Government

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