

Market Research Report on Chinese Mercury-free Thermometers and Sphygmomanometers

(English)



Global village of Beijing

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Foreword

When our family feel unwell, we may take out the mercury thermometer and sphygmomanometer to test her/his body temperature and blood pressure first. But it is an iron that, the small device which is used to detect or to help us to be healthy, is in fact posing a threat to our families and our community.

Mercury, also known as mercury, is a very stable substance in the measurement equipment. But at the same time, it is also a toxic substance which means extremely harmful to human health and lasting impact to the environment. Usually the material used for mercury thermometer and sphygmomanometer is glass. So it is easy to broke the device and make mercury leaking.

Usually an ordinary stick-type or internal standard glass mercury thermometer is about 1 gram, a desktop mercury sphygmomanometer is about 50 grams. It has been calculated that when a thermometer is broken, the leaked mercury will evaporate and the mercury concentration in the air will be 22.2 mg / m³ in a 15 square meters large, three-metre-high room. China's provision of mercury maximum allowable concentration in indoor air is 0.01 mg / m³. Generally it is believed that mercury concentration of 1.2-8.5 mg / cubic metres of the environment can cause people poisoning quickly. Mercury poison on the biology is also quite serious. It was pointed out that "one mercury thermometer can make all fishes in a pond of 20 acres (approximately 80,937 square meters) die."

Mercury thermometer and sphygmomanometer have been subject to the general public and medical staff in the favor, China's annual production of the mercury thermometer (including bar-type and the internal standard type) is up to 150 million, most of which is for domestic use, The scale of production of mercury sphygmomanometer is about 1500 thousand, and the output of these two products are still in an upward trend. Based on these data, we have to consider how much influence the mercury leaking into the environment because of thermometer and sphygmomanometer broken will be to our health and the surrounding environment.

Today, the majority of parents in childhood has been accompanied by a thermometer mercury sphygmomanometer and grew up together, with the mercury pollution of the environment and health risks, we already have in the health of mercury-free substitutes, we also need to their continued commitment to laissez-faire or mercury on the environment and health hazards it, it is still necessary for our future generations, has also experienced the same risks?

To promote reliable mercury-free thermometer and the application of the device in our side to reduce or eliminate mercury pollution and harm, Beijing launched a global village mercury-free substitutes small market surveys, and the status According to the survey made some suggestions and I hope that the relevant departments and the general public some enlightenment.

Manager of "Zero Mercury Campaign" of Global village of Beijing: Xueyu Li

12-20-2007

1. Mercury-free thermometers and sphygmomanometers Overview

At present, there are many types of thermometers and sphygmomanometers in Chinese market. In accordance with principles of production, mercury-free thermometers can be roughly divided into three types which are new type thermometer (digital, electronic thermometer), infrared thermometer and strip thermometer. There are two kinds of mercury-free sphygmomanometer. One is electronic sphygmomanometer, and the other is aneroid sphygmomanometer. The brands of mercury-free thermometers and sphygmomanometers sold in the market are diversity, and the performance, accuracy, use and prices of different brands of products are very different. At the same time, there is also a big gap on the nature and the scale of manufacturing enterprises.

There are some basic information of mercury-free thermometers and sphygmomanometers in Table 1.1 and Table 1.2.

Table 1.1 Basic information of mercury-free thermometers






Category	Brand	Measurement range (□)	Measuring accuracy	Usage	Measuring time	Energy sources	Stability	Price	Chief principle	Chief components	Remark	Picture
New type clinical thermometer	Omron	32.0 □ 44.0	±0.1 □	under arm, oral, and anal	60 second □ 10 minute	Battery (1.2 □ 1.5V)	Common	10 □ 500 Yuan	The temperature sense part's (usually thermistor) temperature varies as environmental temperature	Usually composed by four parts: the head is a temperature sense part, in the middle is the digital temperature display, beside which is power switching button, in the end are battery and lid.	High Price ,not bad stability, battery 's second polluting on environment	
Infrared ray clinical thermometer	Omron	34.0 □ 42.2	±0.2 □	Ear	one □ 3 second	Battery (3 □ 9V)	Common	300-450 Yuan	The former infrared ray sensor measures the temperature of the infrared heat given off by the eardrum. Then, the thermometer converts this temperature into oral or rectal temperature.	Usually composed by five parts: button, shown part, sense part, protective film and infrared ray sensor.	Fast measuring speed but need well operation, high price, low stability, battery 's second polluting on environment	
strip thermometer	Emmy	36.0 □ 39.0	±0.1 □ Exceptional product actions ± 0.5 □	under arm, oral, and forehead	15 second □ 3 minute above	Free	Common	about 20 Yuan	Structure characteristic: some material solidifies in environment of low temperature, and when it meets specific temperature, this heavy material gasifies full of the space, covers the former color and shows corresponding temperature's color.	Mainly part is a safety, non-toxic liquid crystal part	Moderate price, small cubage (about 6 □ 7 cms long, 0.5 cm wide) , convenient to carry and fast measure speed, but definition is not enough	

Table 1.2 Basic Information of Mercury-free Sphygmomanometers

Type of sphygmomanometers	mercury-free	Measurement range	Measuring accuracy	Energy sources	Chief principle	Price	Remark	Picture
electronic	Omron	Blood pressure: 0 □ 299mmHg pulses: 40 □ 180/ Min	±4mmHg pulses:± 0.5%	Battery (2 No. 7 batteries)	electron pressure and the sensor recognize the pulse signal, and express as number form, on the upper part of the screen is systolic pressure, and on the bottom is diastole pressure and the pulse.	200 □ 1300 Yuan	Easy to operate, small cubage, easy to carry, but higher price, battery 's second polluting on environment	
	Yu hao □ Rongkang □	Blood pressure: 0 □ 299mmHg pulses: 40 □ 200/ Min	±3mmHg pulses:± 0.5%	Battery (2-4 No. 7 batteries)				
	Jinyidi	Blood pressure: 0 □ 299mmHg pulses: 40 □ 200/ Min	±3mmHg pulses:± 0.5%	Battery (4 No. 7 batteries)				
	Jiu an		±4mmHg pulses: ± 0.5%	Battery (2 No. 7 batteries)				
	Shanghai Kangzhuang	Blood pressure: 30 □ 280mmHg pulses: 40 □ 199/ Min	±3mmHg pulses: ± 0.4%	Battery (2 No. 7 batteries)				
aneroid	Golden Elephant	Blood pressure: 0 □ 300mmHg	± 4mmHg	Battery (9V)	Electric circuit cooperates with high accuracy capsule pressure gauge to measure body blood pressure. Electronic acousto-optic display cooperates with pressure gauge point .The blood pressure can be read out without a stethoscope.	60 □ 200 Yuan	cheap price, easy to carry, but lower accuracy, battery 's second polluting on environment	
	Ailefen	Blood pressure: 0 □ 300mmHg	± 4mmHg					

2. Mercury-free thermometer market analysis

We did telephone interview, network inquiring and drugstore inspection and collected 39 kinds of mercury-free thermometers from 18 kinds of brands, 10 of which are tympanic thermometers, and 4 of which are strip thermometers, and the rest are electronic thermometers.

2.1 brands and manufacturers analysis

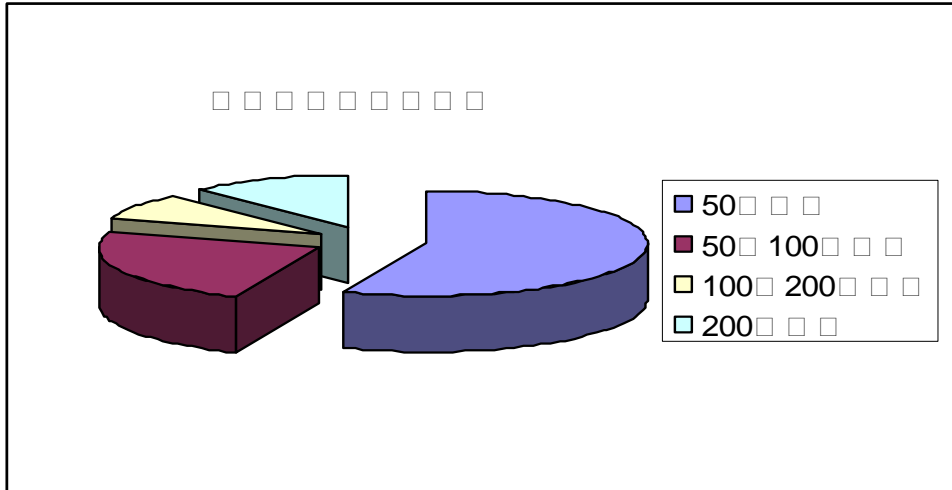
The brands of mercury-free thermometer in the market are diverse. The nature of manufacturer is joint-venture factories, private business, or foreign-owned, and so on. Some enterprises producing mercury-free thermometers are producing mercury thermometer at the same time.

Table 2.1 Manufacture Enterprise Information of Mercury-free Thermometer

Brand	Nature of Enterprise	Type	For domestic sale/ export	Main export place	Whether produce mercury products
Omron	Joint venture	Digital electronic thermometer Infrared ray ear thermometer	For domestic sale/ export	Japan, America and Europe	No
Tianji	Joint venture	Digital electronic thermometer	For domestic sale		No
Meitikang	Taiwan funded	Digital electronic thermometer Infrared ray ear thermometer	For domestic sale/ export (70%export)	Europe, America and Southeast Asia	
Baby of lives	Private business	Digital electronic thermometer Infrared ray ear thermometer Strip thermometer	For domestic sale		
Mountain Tai	Private business	Digital electronic thermometer			Yes
Treasure good health	Wholly foreign Owned Enterprise	Infrared ray ear thermometer	For domestic sale/ export (90% export)	Japan, America and Europe	No
Emmy	Private business	Strip thermometer	For domestic sale		No
Large light	Foreign enterprises (Germany)	Ear and electronic thermometer			
Rui di en	Taiwan funded	Electronic thermometer			
Haire	Private business	Electronic thermometer	For domestic sale		No

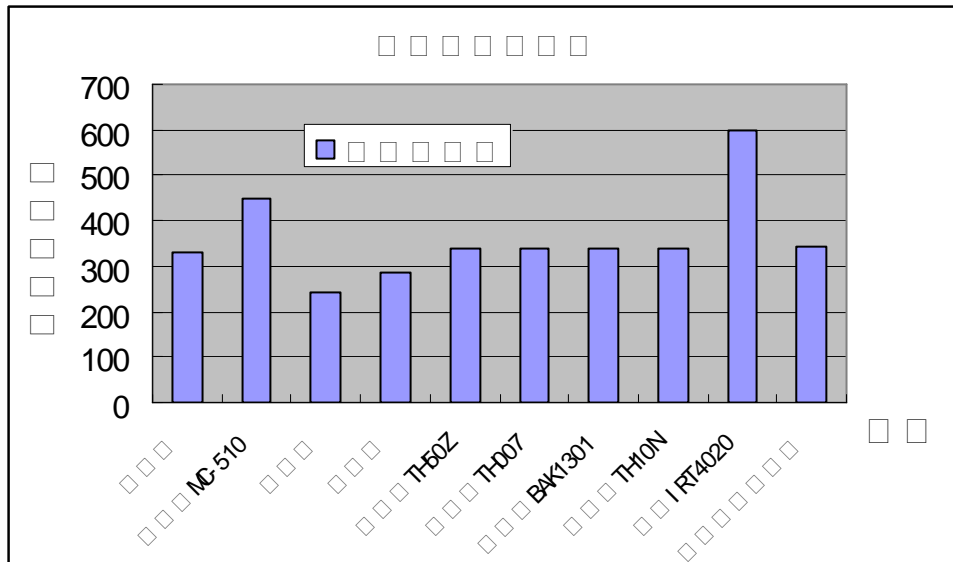
2.2 Price Analysis

Mercury-free thermometers in market are mainly electronic thermometer. Compared with ear type and strip type thermometer, the brands and categories of electronic thermometers are much more various, and the price differentiation is bigger. From the data of survey, the lowest price is 19 Yuan, and the highest price is 398 Yuan. The distribution of the prices is shown in the picture below. Usually, the price of thermometers produced in domestic for export and international brands is relatively higher.



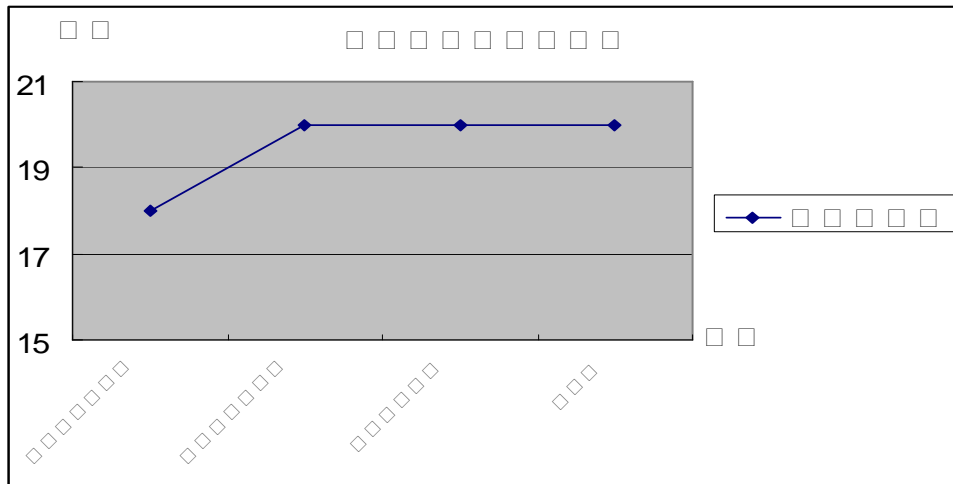
Picture 2.1 Price Distribution of the Electronic Thermometer

Among them, price of ear thermometers is relatively higher, usually between 300 to 400 Yuan. Price differentiation of different brands is not big as the picture shown.



Picture 2.2 Price of ear thermometers

Price of strip thermometers is relatively cheaper and stability, half of which is about 20 Yuan.



Picture 2.3 Price Tendency of Strip Thermometers

3. Mercury-free sphygmomanometers market analysis

We did telephone interview, network inquiring and drugstore inspection and collected 39 kinds of mercury-free sphygmomanometers from 13 kinds of brands, 37 of which are electronic sphygmomanometers, and 2 of which are aneroid sphygmomanometers.

3.1 mercury-free sphygmomanometers manufacturers and production information

There are few kinds of brands of aneroid sphygmomanometers in the market, the main kinds are wei lun and love happy fragrance. There are many kinds of electronic sphygmomanometers and the information detail is shown in table below.

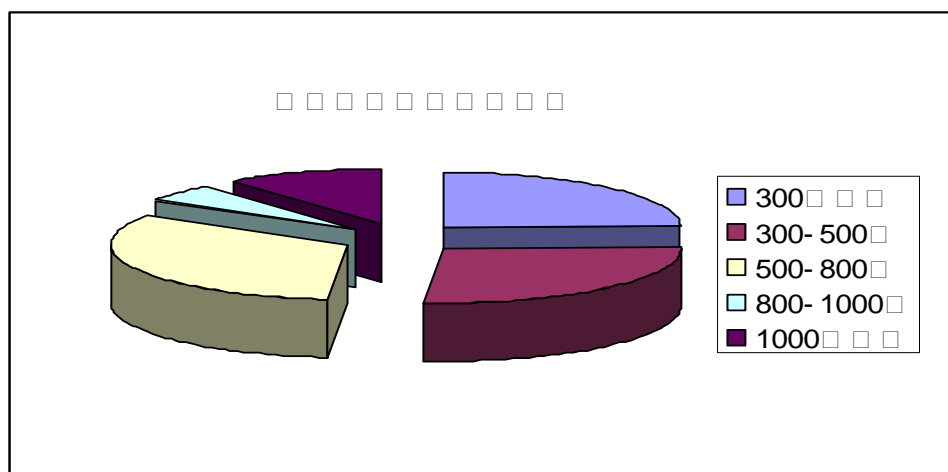
Table 3.1 Manufacturer and Production Information of Electronic Sphygmomanometers

Brand	Nature of Enterprise	Type		Price (Yuan)	For domestic sale/ export	Main export place	Whether produce mercury products	
			Fully automatic	1480				
Omron	Joint venture	Electronic	Upper arm style	HEM- 446C	270	For domestic sale/ export	Japan, America and Europe	No
				HEM- 746C	470			
				HEM- 7000	880			
			HEM- 645	470				
			HEM- 6001	780				
			Wrist style	HEM- 6371T	1150			
				A	280			
			Fully automatic electron	D	380			
Yu hao (Long Kang)	Private business	Electronic		F	580	Export	America, Canada and Europe	No
					280			
					280			
Jinyidi	Private business	Electronic						
Jiuan	China-US joint venture	Electronic	Fully automatic one body wrist style	KD- 726	368	For domestic sale/ Export	Germany, England, Spain, Italy, Poland, America and so on for about 40 countries	
				KD- 622	780			
Shanghai kang zhuang	Taiwan funded			BP102	267			No
Meitikang	Taiwan funded	Electronic	Wrist style		459	For domestic sale/ Export (70%export)	Europe, America and Southeast Asia	
Ruibao	Germany	Electronic	Arm style	KP66R1	300			
Ouxiya	Foreign-fund	Electronic	Fully automatic	BPW221	888	For domestic sale/ Export		No

Brand	Nature of Enterprise	Type			Price (Yuan)	For domestic sale/ export	Main export place	Whether produce mercury products
Li an	ed enterprise	Electronic	Fully automatic		BPW211	788		
		Electronic	Fully automatic		BPW120	698		
		Electronic	Fully automatic		BPW128	688		
		Electronic	Fully automatic		BPW120	598		
		Electronic	Wrist style		KP- 6168-LA	498		
		Electronic	Wrist style		LA- 200	580		
		Electronic	Wrist style		LA- 100	480		
		Electronic	Wrist style		KP- 6188-LA	598		
		Electronic	Manual type		BP4612	238		
		Electronic	Automatic type		BPA100PLU S	1060		
Doctor Mike	Private business	Electronic	Wrist expression		BP3AX1	1080		
		Electronic	Automatic type wrist expression		BP3BZ1-1	530	For domestic sale	No
		Electronic	Automatic type		BP3AG1	480		
		Electronic	Automatic type		BP2BHO	420		
		Electronic	Manual type		BP2B10	248		
		Electronic	Automatic type		BP3BG1- A	470		
Haire	Private business	Electronic	Automatic type		BP3BAO	560	For domestic sale	No
		Electronic	Automatic type		BP3BQ1-3	580		
		Electronic	Manual type		BP3ABO- H	270		
Welch Allyn	Foreign enterprises	Aneroid						
Ailefen	State enterprise	Aneroid		WXB- 50	62	For export/ domestic sale	Singapore and other place	

3.2 Price Analysis

Mercury-free sphygmomanometers in market are mainly electronic sphygmomanometers. The brands and categories of electronic sphygmomanometers are various, and the price differentiation is big. We collected 37 kinds of sphygmomanometers which is the most common production in the market. The most expensive one is automatic electronic sphygmomanometer, which is 1480 Yuan, and the cheapest one is Mike doctor's manual type electronic sphygmomanometer, which is 238 Yuan. The prices distribution of the Electronic sphygmomanometers is shown in the picture below.



Picture 3.1 Prices Distribution of Electronic Sphygmomanometers

There are few kinds of aneroid sphygmomanometers in the market. The main kinds are Welch Allyn and love happy fragrance. Welch Allyn aneroid sphygmomanometer is imported from the USA, and the price is expensive. Is homemade, and the price is much cheaper.

4. Public awareness analysis

“Zero Mercury Campaign” of Global village of Beijing make a questionnaire survey in University of Chinese Medicine about mercury-free thermometer and sphygmomanometers. The respondents include university's teacher, student, and nurse and doctor in the University. There are 82 questionnaire back 82. The investigation result is as following:

Table 4.1 Questionnaire analysis (a)

Stat number object	Number of who has thermometric	Number of who has sphygmomanometers	Number of who has other type mercury-free sphygmomanometers
Student (36 person)	24	20	2
Nurse (12 person)	12	6	3
Teacher (10 person)	10	8	2
Doctor (23 person)	23	14	2
Total (82 peoples)	69	48	9
Remark	All of the thermometers are mercury type.		All of the sphygmomanometers are electronic type.

Table 4.2 Questionnaire Analysis (b)

Price range of mercury-free thermometric can be accepted	Stat number	Price range of mercury-free sphygmomanometers can be accepted	Stat number
10 — 20	31	100 below	31
20 — 50	25	100 — 200	21
50 — 100	7	200 — 500	12
100 — 200	2	500 — 1000	2
The same as mercury type	1	The same as mercury type	1
Doesn't matter	1	Doesn't matter	1

Because respondents of the questionnaire have certain medical science background, so they all clearly know that mercury is harmful to human body. But asked about the existing mercury-free thermometer and sphygmomanometers' brand in the market, 71% of the respondents know nothing about it. The overseas brands like Omron and Panasonic are more famous than homemade brands. Some small homemade brands are not known to anybody. They think the main deflection of mercury-free production is lower accuracy and higher price.

Through this investigation, we discover that people who have professional medical science background are unfamiliar with mercury-free production, and that many people know nothing about it. So the result is that public awareness of mercury-free production is deficient.

5. Suggestion

Through this investigation, we found that there are many factors affecting extension of mercury-free thermometers and sphygmomanometers, such as the price, performance, propaganda, relative policy and so on. On the way of gradually decreasing and limiting the use of mercury and realizing healthy medical treatment, we need government, enterprise, hospital, non-governmental organization and the public to make the concerted effort and face the challenge.

a. The relative departments of government should strictly limit mercury thermometers and sphygmomanometers' sale and usage. Because that our country's standard of medical treatment diagnosis is based on mercury-in-glass thermometer and sphygmomanometers. In this situation, we can strictly limit these two kinds of production to be used in medical treatment diagnosis. Common individual can not buy mercury production and instead use electronic or other types of healthy thermometers and sphygmomanometers. By this method, we can greatly reduce the probability of public to contact mercury, and avoid improper disposal and recycling problems because of distributed use.

Encourage to establish good storage and recycle system of mercury production. The mercury can go back through original sale channel to the original manufacture or to unit which has mercury dispose ability, where to make mercury reuse.

Normalize mercury-free thermometer and sphygmomanometers' market, strictly take charge of production examination to ensure that the quality and accuracy of mercury-free substitute meet national standard. From the investigation result, prices of mercury-free production differ a lot and relatively closely compared to public acceptance. As price factor is the main reason that public use mercury thermometer and sphygmomanometers, it is necessary to standardize these two kinds of production's market price.

b. Manufacturers of thermometer and sphygmomanometers should take a responsible attitude to the public healthy and environment protection. They should consider production's whole life cycle, and strengthen production's follow-up service. They should increase illustration content to let the users know how to dispose fragmentation to protect

himself and decrease harm when accident appears. They should provide channels to obtain materials used in protection and emergency disposal (like sulfur, iron trichloride, tinfoil), or directly sale these materials with production. And if possible, they should consider whether they can recycle the mercury thermometer and sphygmomanometers to avoid mercurial pollution, meanwhile to solve mercury source deficiency.

At the same time, manufactures of mercury-free thermometer and sphygmomanometers should joint together to properly reduce price of production and increase the sales. From the investigation result, the price factor is the main reason that public use mercury thermometer and sphygmomanometers. So it is necessary to reduce the price and give publicity to increase sales and enlarge market.

c. Hospital is the biggest consumer of mercury thermometer and sphygmomanometers, and is the place to maintain public health. So, it is necessary to strengthen education to the users (medical worker, patient, equipment maintenance personnel), and normalize the disposal of broken thermometer and sphygmomanometers and how to recycle mercury.

d. As common users, they should respect their own right-to-know and exercises their right of choice. When choose or continue to use mercury thermometer or sphygmomanometers, they should ask the manufacturer or the distributor to provide information about the attribute, harmful effect, prevention and emergency disposal of the chosen thermometer and sphygmomanometers, and choose safe mercury-free thermometer or sphygmomanometers to avoid latent mercury harm.

At the same time, they should pay attention to whether there is recycle channel of useless mercury thermometer and sphygmomanometers, and actively participate in the callback activity, and do not throw mercury thermometers and sphygmomanometers as household garbage in the garbage bin to decrease mercury contamination.

e. Non-governmental environmental protection organizations should use their natural advantages, under directives of the government effective policy, to actively educate and guide the public and the specific population (like medical workers) to participate in the action of refusing mercury contamination and keeping away from mercury harmful effect, to actively communicate with the government, to feed back NGO 's study and investigation result and public opinions to government, and to provide suggestions to the governmental policy or decision

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