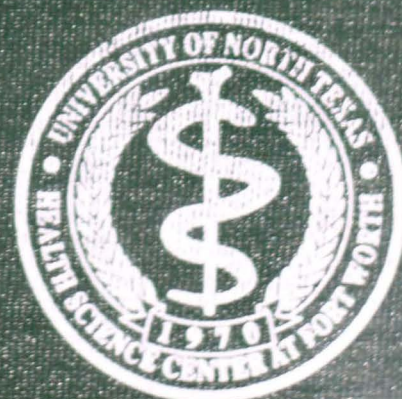




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Food-borne illness is a continuing problem in the United States. Individual's desire for fast and ready to eat food has contributed to the trend. Ready to eat foods increase risk for spread of viral infections, like hepatitis A. Vaccination of service workers against hepatitis A could decrease this risk. Two recent voluntary vaccination campaigns in North Texas attempted to vaccinate this target group. Both campaigns had low vaccination rates. This study assessed barriers impeding access to the campaigns.

Barriers included dissemination of information, knowledge about the disease among the target groups, cost of the vaccine, and language spoken by some of the target group. The study findings showed that these barriers combined contributed to the low vaccination rates for the campaign.

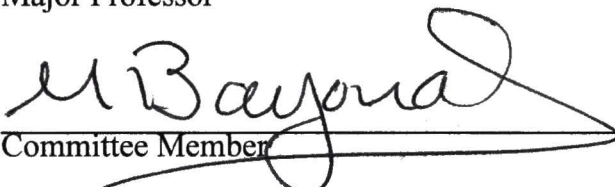
VOLUNTARY HEPATITIS A CAMPAIGNS FOR FOOD HANDLERS
AND DAY CARE WORKERS: EVALUATION
OF PARTICIPATION AND BARRIERS

Rebecca Bosarreyes, B.S.

APPROVED:



Major Professor

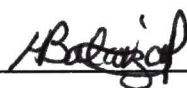


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**VOLUNTARY HEPATITIS A CAMPAIGNS FOR FOOD
HANDLERS AND DAY CARE WORKERS:
EVALUATION OF PARTICPATION
AND BARRIERS**

THESIS

Presented to the School of Public Health

**University of North Texas Health
Health Science Center at Forth Worth**

In Partial Fulfillment of Requirements

For the Degree of

Master of Public Health

**By
Rebecca Bosarreyes, B.S.**

Fort Worth, Texas

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CHAPTER 1

INTRODUCTION TO THE STUDY

Food-borne illness is becoming an increasing problem in the United States and worldwide. According to Motajemi and Käfersteing (1997, p. 5), "Food-borne diseases are one of the most widespread health problems in the contemporary world...." It is estimated that in the United States alone, there are 75 million illnesses, 325,000 hospitalizations, and approximately 5000 deaths every year from food-borne illness. These numbers have been adjusted for underreporting because food-borne illness is continually underreported (Mead, et. al., 1999, p. 607). Motajemi and Käuferstenig (1997, p. 6) state that, "Food-borne diseases have often received low priority in public health programmes [sic] because they have been perceived as mild, self-limiting diseases." The sometimes long-term side effects of food-borne illness, such as cancer or congenital blindness to name a few, are often down played, (Motajemi, Käfersteing 1997, p. 6). The perception that food-borne illness is a mild disease is harmful to the general public because experts think that the risk of food-borne illness is rising. This increase is thought to be occurring due to changes in the way food is distributed, demographics of the general population, and the high turnover rate of food handlers in the food service industry (Collins, 1997, p. 472; Käferstein, K., F., Motarjermi, Y., Bettcher, D., W., 1997, p. 503). The increase in food-borne illness can also be associated with the general public's increased dependence on the food service industry.

With the increase of ready to eat foods in our diets the spread of viruses becomes easier. Ready to eat foods are the ideal vehicles for transmitting viruses because viruses do not reproduce outside their host. Viruses just lay in wait for their next victim ill (Cliver, 1997 p. 92-94). Few people notice or remember the servers that serve them food. However, if the server is ill or has mishandled the food, the effects of their mishandling of the food can last a long time, this is the case with hepatitis A. According to Cliver (1997, p. 90), "Hepatitis A is one of the more severe of food-borne diseases, especially among those caused by viruses." Hepatitis A is a viral infection that attacks the liver. The disease is easily spread through fecal oral transmission (Ciocca, 2000, p. S71). According to the Centers for Disease Control ("CDC"), hepatitis A is one of the most frequently reported vaccine preventable diseases in the United States (U. S. Department of Health and Human Services, 1999, p. 1). It has been suggested that in Spokane Washington a voluntary hepatitis A vaccination campaign among food service workers helped end a community wide epidemic that had occurred in that city for several years (Shaw F. E., 1999, p. 4-5).

Purpose and Scope of the Study:

Currently Dallas and Tarrant counties are thought to have intermediate rates of hepatitis A. Hepatitis A in these counties are considered to have an average occurrence of 10 to 19 cases per 100,000 population (CDC, 1999). In September 1999, several North Texas Cities, located within Dallas and Tarrant Counties, decided to initiate a voluntary hepatitis A vaccination campaign, targeting food handlers and daycare workers. These North Texas cities thought that it could be possible that wide spread use of

hepatitis A vaccination among food service workers and daycare workers could help prevent the spread of hepatitis A in local communities. It was hoped that the vaccination campaign would become a yearly event. However, the results of the first two vaccination campaigns were not what was hoped for, the participation rates for the campaigns were low. In 1999, approximately 20 cities, including Dallas and Fort Worth, participated and approximately 1500 doses of hepatitis A vaccine were given. In 2000, approximately 13 cities participated with approximately 2000 doses given. The target population consisted of 150,000 food handlers and daycare workers. Since Dallas, Fort Worth, and Arlington participated in the vaccination campaigns, many more than 1,500 doses of the vaccine could have been given. It is estimated that 10,000 food handlers and daycare workers work in the City of Arlington alone. Considering the large number of food handlers and daycare workers in the region, this was not a high participation rate.

The primary purpose of this thesis research was to assess participation of these voluntary hepatitis A vaccination campaigns, and to analyze if voluntary participation is possible in hepatitis A vaccination campaigns for food handlers and daycare workers.

This research project included:

- A). Assessment of participation in the hepatitis A vaccination campaigns held in North Texas for 1999, and 2000. This assessment was done in order to determine if voluntary hepatitis A vaccination campaigns for food service and daycare workers is possible.
- B). Analysis of dissemination of information, from manager and regulators, to food handlers and daycare workers about the spread of hepatitis A.

Analysis was also done to ascertain if information was adequately disseminated to the target audience about the hepatitis A vaccination campaigns.

- C). Assessment of how information was disseminated to food handlers that speak Spanish as their primary language. It is thought that due to language barriers information would be even less likely to be transferred.
- D). Determine if gender created any differences in thoughts about the campaign.

The information gained from this study can be used to create more useful vaccination programs of this type in the future.

The research project gathered information by using two questionnaires to assess and compare the hepatitis A vaccination campaigns participation rates of food handlers and daycare workers. The first questionnaires were administered in October 1999. The second questionnaires were administered in August through September of 2000.

Due to the harmful effects of hepatitis A and the low participation rate in 1999 and 2000 hepatitis A vaccination campaigns in North Texas, methods to increase participation in these types of campaigns need exploration. This study is necessary because there are few studies, about the reason food handlers and daycare workers did or did not participate in hepatitis A vaccination campaigns. In spite of continued hepatitis A outbreaks in communities there are not studies that focus on hepatitis A vaccination. Only one report was found, at the time of this investigation, that discussed voluntary hepatitis A vaccination (Walsh, 2000).

The results of the study may have many benefits. The research can inform environmental health departments how to plan vaccination campaigns for hepatitis A. This in turn will benefit the communities of these environmental health departments. Vaccination campaigns will have the potential to decrease the number of food-borne or daycare transmissions of hepatitis A. The study can also provide information on how to improve participation in voluntary vaccination campaigns for any targeted group. The study is one of the firsts of its kind that focused on the outcome of hepatitis A immunization campaigns that target food service and daycare workers.

Review of Literature:

It is really not surprising that current research indicates an increase in the use of the food service industry in the United States. It is estimated that fifty million meals are eaten out each year (Healthatoz.com, 2000). The food service industry in the United States is one of the fastest growing businesses with estimated sales of more than three billion dollars per year. Most consumers over the age of eight eat at least four meals per week outside the home (Collins, 1997, p. 476). The problem with this trend is summed up by this quote by Kenny O'dell, "Each time you patronize a commercial eating establishment, you put your gastrointestinal health in the hands of complete strangers." (HealthAtoZ.com, 2000). Gone are the days when food-borne illness were localized and usually contained within a family unit (Foster, 1997, p. 471). The trend toward fast food and ready to eat alternatives means a single food handler can expose several thousand people to a food-borne illness (Dalton, Haddix, Hoffman, Mast, 1996, p1013). Collins

notes (1997, p. 475), "Consumers want easy access to portable foods." This means the trend for increases in food-borne illness will continue.

The public's dependence on fast ready to eat food is not only limited to use of restaurants. In a recent survey, 40% of grocery shoppers bought Deli Meats and 10% bought ready to eat foods from the supermarket on a weekly basis (Collins, 1997, p. 475). These types of foods lend themselves to the spread of food-borne viruses. It is estimated that there have been an increased number of food-borne illnesses caused by viruses in food. According to Olsen, MacKinon, Goulding, Bean, and Slutsker (2000, p. 4), viruses only account for 1% of all food-borne illness. This does not seem to be a large percentage compared to the overall estimate of 76 million cases of food-borne illness per year. However according to Olsen, et al, (2000, p. 4) and Collins (1997, p. 472), it is estimated that 62% to 68 % of all food-borne illness are of unknown causes. It is also thought that 50% of these cases could be viral in nature because they had an incubation time of more than fifteen hours. This indicates that more viral infections could be related to food-borne illness. However, the current system of passive information gathering and difficult laboratory detection of viruses allows these outbreaks to remain undetected. It is thought that many food-borne illnesses, caused by viruses are not diagnosed (Cliver, 1997, p. 90; Olsen, et. al., 2000, p. 3).

Hepatitis A

There are an estimated 81,391 cases of hepatitis A every year in the United States (Mead et. al, 1999, p.5). It is thought that 11% to 22% of these cases of hepatitis A need hospitalization. An average adult may lose an average of 27 workdays due to the illness

(Bell, Wasley, Shapiro, Margolis, 1999, p. 4). In one recent food related outbreak of hepatitis A, the total cost for the outbreak was estimated at over 800,000 dollars (Dalton et. al., 1996, p. 1013). Only 2% to 3% of all hepatitis A outbreaks have been traced back to be definitively caused by food or water borne transmission (Bell et al, 1999, p. 5; Bell, Et. Al., 1998, p. 1580). However, this does not mean that these are the only incidences of food-borne hepatitis A. It has been documented in several studies that the incidence of hepatitis A is underreported (Bell, et. al., 1998, p. 1579; Motarjemi, et al, 1997, p. 5; Mead 1999, p.4). According to Cliver (1997, p. 94), when he speaks about the reporting system in the United States for food-borne illness:

...food-borne illness are only those occurring in outbreaks that happen to have been investigated (many are not), so illnesses in unrecorded outbreaks and those occurring sporadically, though also food-borne, would not be included. It is also certain that not all diagnosed cases of hepatitis A are reported through official channels...

Since the incubation period of hepatitis A can take up to a month before symptoms appear, it can often be difficult to trace back the source of infection after such a long time. As a result, the rate of incidences of hepatitis A caused by restaurants and food service could be higher (Mead et al, 1999, p. 609; Cliver 1997, p.50). It is estimated that as many as 50% of hepatitis A cases are from an unknown origin (Bell, et. al., 1999, p. 5; Bell et. al., 1998, p. 1580). Hepatitis A also has been found to be heat resistant and resistant to drying, these tendencies give hepatitis A a greater ability to be spread through food (Cliver, 1997, p. 92). Recent food-borne hepatitis A outbreaks have included baked

goods, frozen strawberries, lettuce, shellfish, sandwiches, and dairy products (Bidawid, Farber, Sattar, 2000, p. 2759; Hutin, Pool, et. al, 1999, p. 595; Dalton et. al., 1996, p. 1013; MMWR Weekly, 1993, p. 1; Desenclos, Klontz, Wilder, Nainan, Margolis, Gunn 1991, p.1268; Niu, et. al., 1992, p. 518; Rosenblum, Mirikin, Allen, Safford, Hadler, 1990, p. 1075). The ease with which hepatitis A spreads makes it a disease that can be transmitted without difficulty in restaurants and daycare centers to the general public.

Useful hepatitis A prevention strategies that work for food handlers and daycare workers should be explored to prevent the spread of food-borne hepatitis A. In the summer of 2000, there were reports from North Carolina that one food service worker exposed 2000 people to hepatitis A (MMWR 2000). These exposures could have been completely prevented if the food handler involved had been vaccinated against hepatitis A. It has also been shown that daycare centers have contributed in the spread of community wide outbreaks of hepatitis A (Bell et. al., 1999, p. 10). Another reason to consider vaccinating food handlers and daycare workers is that, these two groups fit many of the criteria for being at high risk for the disease. According to Hutin et al (1999, p. 919), individuals at higher risk in community wide outbreaks of hepatitis A tend to be lower on the socioeconomic scale and tend to be less educated. This description fits a portion of food handlers and daycare workers perfectly. For all these reasons, Cliver recommends (1997, p. 92), that food handlers and daycare workers be vaccinated against hepatitis A. Cases of hepatitis A and other hand-borne pathogens continue to be spread from food service workers and daycare workers. The prevention of the spread of at least

one hand-borne pathogen, such as hepatitis A, would be considered a great achievement to the regulators of food and daycare industry.

Adequate hand washing is frequently an issue during health inspections. It is often thought that good hygiene practices can help prevent the spread of hepatitis A. However, Craig, Sockwell, Shaffner, Moore, Skinner, Williams et al (1998, p. 531), think that hand washing campaigns have not been proven useful in stopping outbreaks of hepatitis A. Most People think they wash their hands frequently enough, but recent research shows that one third of people do not wash hands after using the bathroom, or wash their hands in other situations where hand washing is called for, i.e. after petting an animal (Collins, 1997, p. 477). Through discussions in my work, as a regulator, I have found that many food handlers and daycare workers think that rinsing hands is a sufficient method to keep hands clean. However, a study conducted by Bidawid et. al., (2000, p. 2762) shows that short rinsing of hands did not stop the transference of hepatitis A to food surfaces. Therefore, the belief of food handler and daycare workers that rinsing hands is sufficient to clean hands could be detrimental to another individual's health. This is especially important in daycare settings, since the incidence of transmission hepatitis A is higher in daycare settings than in food service.

Young Children are one of the most vulnerable groups at risk for hepatitis A infection. The spread of hepatitis A is frequently associated with daycare centers, especially those centers that cater to young children, because these facilities are usually where diapers are changed on a regular basis (Bell, et al., 1999, p. 13; Jackson, et. al., 1996, p. 584). It is estimated that 11% to 16% of all hepatitis A infections can be related

to daycare facilities compared to 2 to 3% traced back to food service (Bell, B. P., et al., 1999, p. 5). According to Jackson, et. al. (1996, p.584), attack rates of 15% are common among providers during outbreaks of hepatitis A in childcare facilities.

Record numbers of children currently attend daycare centers. According to The U.S. Census Bureau (1996, p. 70), there are approximately 21 million children under the age of six in the United States, more than 12 million of these children attend daycare. It is thought that 45% of children under the age of one are in childcare on a regular basis. These trends provide hepatitis A an easier route to spread throughout a community. The necessity to change diapers frequently and with many children means the disease can spread easily among young children. Especially if a daycare worker does not wash his or her hands between children, or does not wash the children's hands after changing a diaper. Because of such practices young children easily become infected with hepatitis A due to their natural tendency to place hands in the mouth. The young children then in turn become sources of infections to adults. The problem can become compounded because most children are asymptomatic to hepatitis A. Those parents who change diapers and then do not wash their hands do not realize they are playing Russian roulette with hepatitis A (Bell et al., 1998, p. 1580). Therefore the spread of hepatitis A through an infected daycare worker or the workers inadequate hygiene can effect large sections of any given population. Useful health communication within this group of individuals is important to good public health practices.

Background:

It is common knowledge that food service and daycare workers are underpaid and are expected to perform numerous duties for little substantial benefit. Due to time constraints and lack of training, the food server or daycare worker has very little time to think about how their actions throughout the day can effect the people they serve (Käferstein, et al, 1997, p503; Collins, 1997, p 471). Successful communication with food handlers and daycare workers continues to be an ongoing problem for environmental health departments.

Through my work in a city health department, I have become familiar with the problems of communication between food service and daycare workers and managers. I have found that large numbers of food service workers are monolingual Spanish speakers. This has not been typically the case for daycare workers, but this trend is beginning to change. Regulators continuously strive to create successful methods of communication with Spanish-speaking food service workers. However, language barriers continue to exist, and it can cause problems in food service establishments between management and their employees. In many establishments workers speak only Spanish and managers may speak only English. This type of scenario represents a clear example of communication problems. With the recent boom in the food service industry, and the daycare industry, the risks that are involved with communicating successfully about health concerns to all food handlers and daycare workers is of the utmost importance for the health of the general public. Especially when talking about strategies to prevent the spread of food-borne hepatitis A.

Hepatitis A at the Local Level

In the summer of 1999 there were two widely publicized outbreaks of food-borne hepatitis A in Texas (Walsh, 2000). This prompted many regulators to begin thinking about a proactive approach to the spread of this disease. The majority of food service industry regulators think that prevention is the key to stop the spread of food-borne illness. However, usually due to the nature of outbreaks of food-borne illness, regulators do not get to play a proactive role in the prevention of food-borne or childcare related disease. When outbreaks occur it is usually well underway before regulators are aware of the situation. Therefore, there is a need to use effective preventive measures to stop such outbreaks from occurring. Since the introduction of the hepatitis A vaccine, the vaccine was seen as the first proactive tool to be used in the arsenal against food-borne illness.

In September of 1999 The North Texas Food Safety Council, a group of several north Texas cities that regulate the food service and daycare industry, was looking for a prevention project for Food Safety Month. Food Safety Month is an important initiative to this group. Food Safety Month is an annual event organized by the International Food Safety Council that focuses its attention on food safety in the food service industry and in the general public (International Food Safety Council, 1998). The North Texas Food Safety Council thought that Food Safety Month would be an ideal time to launch an annual hepatitis A vaccination campaign for food handlers and daycare workers.

Therefore in September of 1999, the members of the North Texas Food Safety Council initiated a hepatitis A vaccination campaign. This was a voluntary campaign to encourage food service workers and daycare workers to participate in the hepatitis A

vaccination. The campaigns thus far have been yearly events. The results of these campaigns were not what many cities anticipated because the participation rate was low. Approximately 20 North Texas cities, including Dallas and Fort Worth, participated in the 1999 campaign, and approximately 1,500 doses of hepatitis A vaccine were administered to a target group of approximately 150,000 food handler and daycare workers (Bosarreyes, 1999). The campaign was repeated in 2000. However, no definitive figures have been given about the number of individuals vaccinated at this time, but it is estimated that 2000 doses of hepatitis A vaccine were administered. The low participation rate has already stopped many cities from considering participating in the yearly event. There are many lessons learned from this study about effective vaccination campaigns of this type.

CHAPTER 2

RESEARCH DESIGN AND METHODOLOGY

Study Design:

The study is a cross-sectional survey to determine reasons why food handlers, daycare workers, and managers did or did not participate in vaccination campaigns as part of the "Food Safety Month" program. A questionnaire was used to learn about elements of knowledge, thoughts, attitude, best way to communicate with target population, gender, occupation, language or city where employed (Arlington or Fort Worth) play a part in the participation. A total of 327 daycare workers and food handlers responded to the questionnaires in 1999. There were 95 managers that participated in the surveys that were distributed in 1999 and 2000.

- 1). In November 1999 the first survey was given to approximately one hundred individuals that attended the City of Arlington food handler, and daycare classes. Simultaneously surveys were distributed three hundred individuals that participated in the City of Fort Worth Health Departments food handler and daycare classes. At the time of the survey, both food handler and daycare workers attended the same "Food Handlers Class". The questionnaire was provided in the following manner.

- a). Surveys were administered in food handler classrooms and retrieved by health department staff at the end of each session.

These classes were weekly events that occur at both health departments.

- b). A cover letter/ informed consent was attached to each survey that stated that this is a voluntary activity and would in no way effect their receipt of a food handler card.
- 2). The second survey included food service and daycare managers. The surveying process began in 1999 and was completed in 2000. The questionnaire was provided in the following manner:
- a). Eight Environmental Health Specialists of the City of Arlington, and Fifteen Environmental Health Specialist from the City of Fort Worth distributed the questionnaires to daycare managers and food service managers.
 - b). The surveys were distributed to managers during random inspections and were given directly to the managers in charge of the facility. The health inspector gave the survey to the manager at the beginning of the inspection.
 - c). The inspector then explained that they would collect the survey at the end of the inspection
 - d). The survey included a cover letter/ informed consent that stated that filling out the survey was completely voluntary and failure to fill out forms would not affect the results of the health inspection.

- e). The manager was also provided with an envelope and was instructed to place the survey in the envelope after it was completed.
- f). The inspector collected the survey at the end of the inspection, and then the inspector returned the sealed envelope to the City of Arlington Health Division and placed it in a designated box. The managers in the 1999 surveys were asked to return the survey in stamped self-addressed envelope.
- g). The project was conducted in November 1999 and from August through October 2000.

The questionnaires included cover letters/ informed consent explaining the purpose of the study and that participation was voluntary. There was no identifying information on any of the surveys.

Statistical Analysis:

All data was analyzed through the use of SPSS (SPSS) statistical software and EPI INFO (Dean, A., G., et. al., 1995). First, descriptive statistics were used to analyze data. Descriptive statistics, including simple counts and percentages, were used to illustrate the distribution of each of the variables among age groups, languages, occupation genders, and between cities by using cross-tabulations. Reasons for participation were compared between years, cities, gender, language, or occupation. The Odds Ratio was used as a measure of association, the Cornfield's or the Fisher's exact 95% confidence intervals for the Odds Ratio were also calculated (Rothman, K.,

Greenland, S. 1998). The chi-square or the Fisher's exact tests were used to assess the statistical significance of the Odds Ratios (p-values) (Daniel, W. W., 1999). Surveys were assessed according to language used, and the city where the participant worked. Then food manager responses were compared to food handler responses.

CHAPTER 3

RESULTS

Data Interpretation:

The study began in November 1999, initially a total of 400 surveys were distributed to food handlers and daycare workers that participated in food handler classes in Arlington and Ft. Worth. Of those 400 surveys that were distributed, 327 of them were completed, giving this survey a response rate of 82%.

In 1999 one hundred surveys were distributed to managers and only 10 surveys were returned. In the 2000 vaccination campaign one hundred surveys were distributed to managers and only eighty-five surveys were completed. There were a total of 95 manager surveys completed. The response rate for managers was higher in the second survey, because health department personnel were asked to return the surveys to health department rather than mailing them in. Therefore, the overall for the response rate for 1999 and 2000 managers' survey was 48%.

Table 1 titled "Food Handler Demographics" shows, the demographic characteristics of the food handler and daycare participants that participated in 1999. Table 1 shows that 34% of participants were from Arlington and 66% were from Fort Worth. Of the total population studied 74% spoke English and 27% spoke Spanish. Table 2, shows that the majority of the food handlers and daycare workers were young, 59% of food handlers and daycare workers were thirty years old or younger. Table 3

shows this finding was similar when compared by both cities, when compared by the two languages spoken as shown in Table 4. The age distribution of the managers that were surveyed is shown in Table 5. Only 21% of managers surveyed were thirty years old or younger.

Table: 1
Food Handlers and Daycare Workers Demographic Characteristics 1999

Question	Respondents	(Percentages)
City where participant worked		
Arlington	112	(34)
Ft. Worth	215	(66)
Language spoken by participant		
English	248	(74)
Spanish	89	(27)

Table 2
Age Distribution of Food Handlers and Daycare Workers 1999

Question	Respondents	(Percentages)
15 to 20 years old	94	(29)
21 to 30 years old	96	(30)
31 to 40 years old	64	(20)
41 to 50 years old	45	(13)
51 years old or more	26	(8)
	325	(100)

Table 3

Age Distribution of Food Handlers and Daycare Workers by City 1999

Question	Arlington	(%)	Ft. Worth	(%)
15 to 20 years old	31	(29)	63	(30)
21 to 30 years old	30	(28)	63	(30)
31 to 40 years old	23	(22)	38	(18)
41 to 50 years old	12	(12)	30	(14)
51 years old or more	10	(9)	15	(7)
	106	(100)	209	(100)

Table 4

Age Distribution of Food Handlers and Daycare workers by Language 1999

Question	English	(%)	Spanish	(%)
15 to 20 years old	79	(33)	15	(17)
21 to 30 years old	62	(26)	34	(42)
31 to 40 years old	49	(20)	15	(17)
41 to 50 years old	29	(12)	16	(19)
51 years old or more	22	(9)	4	(5)
	241	(100)	84	(100)

Table 5
Age Distribution of Managers 2000

Question	Respondents	(Percentages)
15 to 20 years old	38	(3)
21 to 30 years old	16	(19)
31 to 40 years old	27	(32)
41 to 50 years old	30	(35)
51 years old or more	10	(11)
	85	(100)

In Table 6 demonstrates that only 16% of respondents knew about the vaccination campaign. Of that 16%, half of them (8%) received their hepatitis A vaccination in 1999. Also in Table 6, 90% of respondents stated that they would get the hepatitis A vaccination if they could.

Basically there were four major findings of the first part of the study (1999). First, food handlers and daycare workers did not know that hepatitis A vaccinations were given. Second, food handlers and daycare workers were unaware of how the disease was spread. Third, the cost of the vaccine and who should pay for the vaccines is a major issue. Fourth, language spoken by participant did play some role in who did receive the vaccine. These were not the only findings of the study but these are the four major areas that will be discussed in detail. Other areas of interest of the study will only be briefly presented.

Table: 6

Frequencies and Percentages of Food Handlers and Daycare Workers 1999

Should food handlers be concerned
about hepatitis A

Yes	303	(96)
No	13	(4)

Did or did not know if shot was offered

Yes	50	(16)
No	267	(84)

Did or did not get vaccinated

Yes	22	(8)
No	240	(92)

Did not get shot, but they would if they could

Yes	254	(90)
No	28	(10)

No vaccine and would or would not be afraid to
be vaccinated

Yes	44	(15)
No	254	(85)

Did receive shot and were or were not afraid

Yes	4	(17)
No	19	(83)

Would you take shot if required to by the
health Department

Yes	284	(95)
No	14	(5)

Should the Health Department
require the vaccine

Yes	25	(84)
No	49	(16)

Table 7 shows the answers to “Why Food Handlers and Daycare Workers Responses to why they did not Receive Vaccination? by City 1999”. Respondents stated that the main reason that they did not receive the vaccination, when asked, was that they did not know about the vaccination campaign. Food handlers and daycare workers in Arlington were 2 times more likely to answer that they did not know vaccinations were offered when compared to those from Fort Worth.

Table 7
Food Handlers and Daycare Workers Responses to why they did not Receive Vaccination? by City 1999

Question	Arlington	Ft. Worth		
Price of vaccine to high	1	2		
Location where shots were Offered	2	4		
Time shots were given	2	4		
Notice about shots was to short	3	7		
No transportation to place shot Offered	0	5		
Other	13	49	OR (95% CI)	p-value
Total	21	71		
Did not know shots were offered	64	109	1.99 (1.08, 3.68)	0.026
Total	85	180		

Table 8 compares the answers to the question why food handlers and daycare workers did not receive vaccination by language. English speakers were 2.14 times more likely than Spanish Speakers to respond that they did not know about the vaccination campaign. This comparison though important was not statistically significant.

Table 8
Food Handlers and Daycare workers Response to Why Food Handlers did not Receive Vaccination? by Language 1999

Question	English	Spanish		
Price of vaccine to high	2	2		
Location where vaccines were offered	2	4		
Time shots were given	5	1		
No transportation to place shot offered	6	4	OR (95% CI)	p-value
Total	15	11		
Did not know shots were Offered	134	46	2.14 (0.84, 5.37)	0.121
Total	149	57		

Further analysis of “Food Handler Data Comparisons of Responses by Language”, Table 9 shows English speakers were 2.4 times more likely than Spanish Speakers to be vaccinated. This comparison though strong was not found to be statistically significant.

Table: 9
Food Handlers Data Comparison of Responses by Language 1999

Question	English	Spanish	OR (95% CI)	p-value
Should food handlers be concerned about Hepatitis A				
Yes	228	75	Indeterminate	0.440
No	13	0		
Did or did not know if shot was offered				
Yes	36	14	0.745	0.466
No	207	60	(0.377, 1.473)	
Did or did not get vaccinated				
Yes	20	2	2.435	0.389
No	193	47	(0.55, 10.785)	
Did not get shot but they would if they could				
Yes	186	68	0.101	0.005
No	27	1	(0.014, 0.760)	
No vaccine and would or would not be afraid to take shot				
Yes	34	10	1.052	0.999
No	194	60	(0.491, 2.253)	
Did receive shot and were or were not afraid				
Yes	3	1	0.353	0.453
No	17	2	(0.024, 5.231)	
Would you take shot if required to				
Yes	216	68	1.271	0.750
No	10	4	(0.386, 4.181)	
Should the Health Department require the vaccine				
Yes	179	71	Indeterminate	0.000
No	49	0		

In further analysis on this topic “Food Handler and Daycare Knowledge, Compared to Managers, Language, by City” demonstrates that Managers were 1.67 times more likely to know that the vaccination was offered than food handlers and daycare workers were. This contrast was not statistically significant (Table 10).

Table: 10
Food Handler and Daycare Knowledge, Compared to Managers, Language, by City 1999 and 2000

Question	Yes	No	OR (95% CI)	p-value
Knew or did not know vaccine was offered				
Managers	10	50	1.67	0.189
Food Handlers	50	267	(0.72, 3.81)	
Knew how disease was spread				
Managers	47	35	14.94	0.001
Food Handlers	24	267	(7.83, 28.70)	
Knew how disease was spread				
English	28	209	8.71	0.012
Spanish	1	65	(1.23, 175.32)	
Knew how disease was spread				
Arlington	4	89	0.84	0.780
Ft. Worth	10	188	(0.22, 3.04)	

Tables 11 and Table 12, show knowledge of the participants that were surveyed. This analysis was done by asking participants how hepatitis A was spread. The first set of responses for this question are found in Table 11, “Food Handlers and Daycare

Workers Responses on How Hepatitis A is Spread” It was found that only 8% of food handlers and daycare workers knew the correct answer. This information was then compared to manager’s knowledge about the spread of Hepatitis A (Table 10). The comparison shows that 57% of managers knew how hepatitis A was spread. The Managers were 14.94 times more likely to know how hepatitis A was spread than food handlers and daycare workers.

Table 11
Food Handlers and Daycare Workers Responses on How Hepatitis A is Spread 1999

	Respondents	(Percentages)
Disease spread by not washing hands properly after using bathroom	24	(8)
Coughing then not washing hands	14	(5)
Cross contamination of raw and cooked foods	15	(5)
All of the answers mentioned previously are correct	173	(60)
I am not sure how people get sick	65	(22)
	291	(100)

Table 12 shows that English speaking respondents were 8.71 times more likely than Spanish speaking respondents to know how the disease was spread.

Table 12

Food Handlers Responses on How Hepatitis A is Spread Compared by Language 1999

Question	English	Spanish		
Disease spread by coughing and not washing hands	6	8		
Disease spread by cross contamination of cooked foods with raw foods	8	10		
All of the answers mentioned previously are correct	145	32		
Unsure of how disease is transmitted	50	15	OR (95% CI)	p-value
Total	209	65		
Disease spread by not washing hands properly after using bathroom	28	1	8.71 (1.23, 175.32)	0.012
	237	66		

The difference of knowledge of how the disease was spread was also compared by cities. The information about this comparison can be seen in Table 13. It appears that employees in Arlington were 16% less likely than employees in Fort Worth to know the how hepatitis A was spread. However, this was a weak association and not statistically significant.

Table 13

Food Handlers and Daycare Workers Responses on How Hepatitis A is Spread by City 1999

Question	Arlington	Ft. Worth		
Disease spread by coughing and not washing hands	4	10		
Disease spread by cross contamination of cooked foods with raw foods	5	10		
All of the answers mentioned previously are correct	53	120		
Unsure of how disease is transmitted	3	42	OR (95% CI)	p-value
Total	85	182		
Disease spread by not washing hands properly after using bathroom	8	16	0.84 (0.22, 3.04)	0.780
	93	198		

The fourth major variable that was assessed was whether or not cost played a factor in the vaccination process. Table 14 "Comparison of Managers and Food Handlers/Daycare Workers on the Question Whom Should Pay for Vaccination", shows what employees versus management thought about payment for the vaccination. The table shows that proportionally food handlers were 1.21 times more likely than managers were, to think employees should pay for the vaccination. This difference was not a strong association and it was not statistically significant. Food handlers were also 5.12 times more likely than managers were to say that the employer should pay for the vaccination. This difference was statistically significant ($p = 0.001$). Food handlers were 44% less likely

than managers to say that the health department should pay for vaccination, but this comparison was not statistically significant. Finally this table shows that food handlers were 80% less likely than managers to say that there should be a combination of payment between food handlers and daycare workers, employers and the health department. This contrast was statistically significant ($p = 0.001$). This was not the only difference found while contrasting various aspects of the same question.

Table: 14
Comparison of Managers and Food Handlers/Daycare Workers on the Question Whom Should Pay for Vaccination 1999 and 2000

Question	Yes	No	OR (95% CI)	p-value
Employee				
Managers	9	73	1.21	0.627
Food handlers	36	241	(0.53, 2.84)	
Employer				
Managers	14	54	0.02	0.001
Food Handlers	158	119	(0.10, 0.38)	
Health Department				
Managers	21	61	1.53	0.203
Food Handlers	51	226	(0.283, 0.82)	
Combination of three previously Listed				
Managers	38	44	6.61	0.001
Food handlers	32	245	(3.60, 12.17)	

Table 15 shows that food handlers and daycare workers in Arlington were 1.71 times more likely than employees in Fort Worth, to say that the employer should pay for the vaccination. However, a portion of food handlers in Arlington were 59 % less likely than in Fort Worth to think that the health department should pay for the vaccine. This analysis was statistically significant ($p = 0.030$). The final analysis in this group was a comparison of food handlers responses compared by the language spoken (Table 16).

Table 15
Food Handlers Responses on whom Should pay for Vaccination by City 1999

Question	Arlington	Ft. Worth	OR (95% CI)	p-value
Employee				
Yes	10	21	1.02	0.879
No	75	161	(0.420, 2.42)	
Employer				
Yes	57	99	1.71	0.068
No	30	83	(0.96, 3.03)	
Health Department				
Yes	9	41	0.41	0.030
No	76	141	(0.17, 0.93)	
Combination of three listed				
Yes	9	21	0.91	0.983
No	76	161	(0.37, 2.21)	

The analysis of participant's languages can be found in Table 16. The table is titled "Food Handlers Responses on Who Should Pay Compared by Language." In this table it was found that English speakers were 1.34 times more likely than Spanish speakers were to think that the employee should pay for the vaccination. However, English speakers were 66% less likely than Spanish speakers were to think that the employer should pay for the vaccination. This contrast was statistically significantly ($p = 0.004$).

Table 16
Food Handlers Responses on whom Should Pay for Vaccination by Language 1999

Question	English	Spanish	OR (95% CI)	p-value
Employee				
Yes	30	6	1.34	0.688
No	190	51	(0.50, 3.81)	
Employer				
Yes	117	41	0.44	0.165
No	103	16	(0.22, 0.87)	
Health Department				
Yes	41	10	1.08	0.998
No	179	47	(0.48, 2.48)	
Combination of three listed				
Yes	32	0	indeterminate	0.004
No	188	57		

Another finding of the study was that food handlers and food service managers thought the hepatitis A vaccination should be required to work in food service or daycare.

The analysis was done with four different methods of comparison. The answers were compared by language, by city, what management thought, and what management thought compared by gender. The first comparison is detailed in Table 6, 95% of food handlers and daycare workers thought that if a health department, required the Hepatitis A vaccination they would do be vaccinated. The next question then asked should the health department require the vaccination, 84% of respondents responded yes that the hepatitis A vaccine should be required to work in food service. The responses to this question were then analyzed by city in which the participant worked.

Table 17, shows that in Arlington food handlers were 1.21 times more likely than Fort Worth to be vaccinated if required to do so. This difference was statistically significant. This trend was however reversed when food handlers were asked should the health department require this vaccination. It appears that food handlers in Arlington are 35% less likely than employees in Fort Worth were, to think that the vaccination should be required.

Table 17
Food Handlers and Daycare Workers Responses about Requirement of Vaccination 1999

Question	Arlington	Ft. Worth	OR (95% CI)	p-value
Would you be vaccinated if if health department required it				
Yes	90	186	1.21	0.999
No	4	10	(0.369, 3.963)	
Should the health department require the vaccination				
Yes	72	181	0.655	0.225
No	18	28	(0.341, 1.258)	

Opinions on this issue were compared based on respondents' language. This analysis can be found in Table 10 titled "Food Handler Comparisons of Answers by Language." This table shows that English-speaking food handlers and daycare providers, would be 1.27 times more likely than Spanish-speaking food handlers and daycare providers, to be vaccinated if required to do so. This correlation was not statistically significant. However, all the individuals that spoke Spanish thought that the vaccination should be required to work in food service. This comparison was found to be statistically significant. The following analysis involved food service managers.

Approximately 62% of all food service managers thought hepatitis A vaccination should be required to work in food service. Table 18 titled "Cross tabulations of Managers by Gender" shows that woman were 1.2 more likely than men, to think that the vaccination should be required. The difference was statistically significant ($p = 0.030$). Gender was important because most food service managers are men. Therefore if they are less willing to promote the vaccination campaign this creates problems for spreading information about the vaccination campaign. This was the final comparison done about participants' responses about requiring hepatitis A vaccination to work in food service or daycare. How food service and day care facilities could be contacted is the next topic.

Finding regarding best way to inform food handler and daycare workers responses about vaccination is shown in Table 19. Most food handlers and daycare workers think that the best way to inform them about the vaccination campaigns would be through food handler classes. Followed by contacting them through a newsletter and/ or mass

mailings. Many food handlers responded that media would be a means of communication when asked for other means to contact them.

Table 18

Cross-Tabulation of Managers Answers by Gender Responses 2000

Question	Female	Male	OR (95% CI)	p-value
Is this type of campaign effective to stop spread of hepatitis A				
Yes	31	39	0.636	0.724
No	5	4	(0.157, 2.570)	
Should the Health Department Require this vaccine to work in food service				
Yes	27	23	1.204	0.030
No	7	20	(1.204, 9.346)	
Do you believe hepatitis A is important to food service				
Yes	32	40	.800	0.999
No	2	2	(0.107, 5.997)	

Table 19

Survey Results on Best way to Inform Food Handlers about such Types of Vaccinations
1999

Question	Respondents	(Percentages)
Sending out newsletter		
Yes	84	(28)
No	220	(72)
Mass mailing restaurants		
Yes	73	(24)
No	231	(86)
Calling facilities to inform them about vaccination programs		
Yes	25	(8)
No	279	(91)
Conversations with inspectors during Inspections		
Yes	33	(11)
No	271	(89)
Informing food handlers during food handler classes		
Yes	119	(40)
No	185	(60)

Managers thought the best way to contact them would be through mass mailing, followed by use of media. Managers also thought that food handler classes were a good resource for informing the target audience (Table 20).

Table 20
Managers Responses on Best way to Contact Food Establishments 2000

Question	Yes	(%)	No	(%)
Mass Mailing	38	(45)	45	(53)
Use of Media	35	(41)	48	(57)
Use of food handler classes	36	(42)	47	(55)
Use of inspectors during inspections	28	(33)	55	(65)

The last item that was analyzed was how those food handler and daycare participants that were vaccinated heard about the campaign. Particularly how Spanish-speaking participants heard about the campaign compared to English speakers. Only sixteen individuals answered the question and of those sixteen, only three Spanish speakers answered the question, so due to the small sample size no further tabulations were done.

CHAPTER 4

DISCUSSION

There were various important findings in the study. First was the number of food handlers that said they knew about the hepatitis A Campaign. Analysis shows that in 1999, 16% of respondents among daycare and food handlers knew about the vaccination campaign. Of these 16% half (8%) responded that they were vaccinated. Since this was the first time the vaccination was offered having 16% of your target audience knowing about the vaccination campaign was good especially.

However, I wonder about the percentage of individuals that stated they were vaccinated. Approximately 8% of the target population stated that they had been vaccinated during Food Safety Month. This percentage seems high, especially since this number does not coincide with estimated vaccination numbers. In 1999, Fort Worth vaccinated approximately 150 individuals, in an estimated target population of 25,000. The Fort Worth vaccination rate would be approximately 0.6%. In Arlington the target population is 10,000. The city of Arlington vaccinated approximately 30 individuals against hepatitis A. At best estimates City of Arlington had a vaccination rate of 0.03%. These percentages are not close to the response of 8% of the population, which was found in the survey. The difference could be attributed to respondents misunderstanding the question. The respondent might have thought the questionnaire asked, "have you ever received the hepatitis A vaccine," rather than "Did you receive the vaccination during

Food Safety Month". This is one of the problems with data collection one never knows the intent of the participants or if they understood the questionnaire.

One thing was clear from the analysis, food handlers and daycare workers did not know about the hepatitis A vaccination campaign. Data show that the difference was apparent by city where the food handler or daycare worker, worked, and by language spoken that they spoke. This contrast was also apparent when compared to managers' knowledge about the campaign and that of the food handlers and daycare workers. More managers' reported that they knew about the campaign than food handlers and daycare workers. Food handlers and daycare workers were two times more likely to answer that they did not know about the vaccination in Arlington than in Fort Worth. Since Fort Worth is larger than Arlington, one would expect this trend to be different. I would have thought that in a smaller city more people would know about the vaccination campaign than in a larger one.

This could be explained by the differences in the education process in the two cities. In Fort Worth, food handler, and daycare classes, were taught by environmental health specialists. In contrast with the city of Arlington food handlers, and day care workers, who were shown a video, and received no other type of instruction. The instructors in Fort Worth, may have used food handler classes to inform participants about the vaccination campaign. In Arlington no such education took place. More research on this subject is needed to explain why this difference occurred.

One of the main premises of my research was, that language barriers would cause Spanish-speaking employees to be less likely to hear about the vaccination campaign.

The results found this not to be true. English speakers were almost two and a half times more likely to state they had not heard about the campaign than Spanish speakers had. This difference was a very surprising result. The sample size of the Spanish-speaking participants may have accounted for this finding. There were considerably less Spanish speakers participating in the study than English speakers. Another confounding factor could be literacy levels in the Spanish food handler classes. I have taught many food handler classes in Spanish, and I have found that each class has varying levels of literacy. I have noticed that many low literacy workers are accustomed to using another individual with higher literacy levels to fill out any paper work they receive. Several surveys appeared to have very similar handwriting. Therefore a person who was literate could have filled out the other respondents' surveys.

It could be possible the difference could be explained because Spanish speaking food handlers may have a better verbal networking system than English speaking food handlers might have. However, no research was found to back up this theory. Definitely more research is needed on this topic to discover why there was such a difference between the two groups.

Even though more Spanish speakers knew about the hepatitis A vaccination campaign, English speakers were almost two and a half times more likely to respond that they had received the vaccination, than Spanish-speakers were. Why more Spanish-speaking individuals knew about the campaign yet where not vaccinated is another area of possible research. It is evident that knowledge about the campaign was not the only barrier to vaccination. This seems to be true for all groups that were surveyed. One of

the most important barriers to participation in the campaigns is the price of the vaccine. Spanish-speaking food handlers tend to work in the lower paid positions in food service; therefore, \$25.00 per vaccination is a large portion of their paycheck.

Managers were more than one and a half times more likely to know about the vaccination campaign than food handler and daycare workers. Communication about the vaccination to food handlers and daycare workers through management appeared to be a problem. It was hypothesized that due to the difficulty of not directly accessing food handlers and daycare workers that the information might not be passed on. This theory appears to be true. Another reason could be that managers were surveyed at a later time than the food handlers and daycare workers. In addition a follow-up question was asked about how managers informed their employees about the vaccination campaign. A few managers were honest and said they knew about the campaign and did not tell their employees due to time constraints. Some managers thought hand washing and sanitizing were sufficient methods for the control of hepatitis A, and that vaccination was not necessary.

Additional information regarding regulators and managers attitudes on hepatitis A vaccination was gathered through personal communication. A manager said that her company had told her to post the information about hepatitis A vaccination, however, they would not officially encourage food handlers to participate. The company did not want to proactively encourage employees to be vaccinated.

One regulator stated that his company would wait out the odds and they would rather pay for an outbreak, and depend on their insurance to cover the costs. This would

be more preferable to his company than to be continuously paying for vaccinations for their employees due to high turn over rate of employees. High turnover rates have continuously been a problem that plagues the food service and daycare industry (Collins, 1997, p. 472). This could be some of the reasons that managers are not relaying information to their employees. However there are not any studies on this topic. Therefore, it is recommended that more research on this topic should be done.

Knowledge about how hepatitis A was spread, was an another important question in this study. Only 8% of food handlers knew the correct answer compared to 57% of managers that knew the correct answer. Managers were 14.94 times more likely to know the answer than food handlers and daycare workers. In both Arlington and in Fort Worth one manger per establishment is required to take a class in food protection management. During this class hepatitis A is one of the required topics that is taught. This might explain some of the difference between knowledge levels between managers and employees. One of the main reasons that managers are required to take these courses is so that they can go back and use the information they have gained to teach their employees and implement this knowledge in their establishments. It appears with such a great difference in knowledge levels that this transfer of information is not happening. Collins (1997, p. 475) recommends, that education of food handlers in food service be a continual process. This continual educational process would help stop the spread of food-borne diseases. It is recommended that future studies be done on this topic.

Language and possibly education level seem to be barriers in terms of knowledge of how the disease was spread. English speaking participants were over eight and a half

times more likely to know what caused hepatitis A than Spanish speaking participants. This might account for why Spanish-speaking food handlers did not participate as much in the vaccination campaign. They may not have had enough information about what caused the disease and therefore did not see a need for the vaccine.

There is a real question if Spanish-speaking food handlers need hepatitis A vaccination. According to Tanaka (2000, p. S59), the seroprevalence of anti-HAV in Mexico was nearly 90% prevalence in 11-15 year olds. Rates were found to be in higher in lower income individuals. Since most Spanish-speaking food handlers come from lower income households, and tend to be rural, where chlorinating water is less likely. It makes one wonder if recommending the vaccine for this group is necessary. Environmental factors may have already exposed many Spanish-speaking food handlers to hepatitis A therefore the vaccine would be unnecessary. This hypothesis definitely needs further research.

Cost seems to be an integral reason that participants in the study were not vaccinated. According to unpublished data provided by the Texas Department of Health (2000) the average vaccine costs around \$50 per dose. Two doses are required for complete immunity. Because governmental rates are lower that is why the vaccination was offered at \$25.00 per vaccination. However, since food handlers and daycare workers are paid minimum wage. Twenty-five dollars is approximately four hours of an average workday for a food handler or daycare worker. In addition to this all food handlers and daycare workers in both cities are required to have food handler permits. These food handlers permit costs on average \$10.00, which equals to about two hours of

the employee's salary. This is normally paid for by the food handler or daycare worker, and is rarely paid for by employer.

The vaccine would cost for most employees approximately six hours or one days salary. It is easy to see why most participants of the study would not be willing or motivated to pay out voluntarily for the vaccination. This is probably why 5.4 times more food handlers said the employer should pay than the employee. On the reverse side managers were six times more likely to say that there should be a cost sharing for the vaccination. However, as mentioned earlier, high turnover rates of employees in the food service and daycare industry, may not be an incentive for the industry to pay for the vaccination. It was found in this study that the mean price that food service and day care workers responded they would pay for the vaccination is \$13.83. Until the cost of the vaccine is addressed these types of vaccination campaigns will have problems. Other research shows that the cost of the hepatitis A vaccine has been prohibitive in other types of hepatitis A vaccination campaigns to other targeted groups. The cost of the vaccine and the additional amount of outreach needed to reach target audience, made success of these campaigns difficult (Hutin, et. al., 1999, p. 921; Bell et. al., 1999, p. 10). Methods to overcome this problem must be found through further research.

Another finding shows that 95% of participants', in both questionnaires, thought that if vaccination was required, they would be willing to be vaccinated. Approximately 84% of food handler and daycare workers thought the vaccination should be required to work in daycare and food service, 62% of managers thought this also.

Another important finding in relation to the vaccination campaigns was participant's opinions on the best way to inform them about the vaccination. Most participants thought that mass mailings were the best way to contact them. This method was used by both Arlington and Fort Worth to reach the target audience. However, mass mailing did not seem to be successful because of the low participation awareness rates, found in the analysis. Managers indicated the media as one of the next best methods to inform facilities of this type of campaign. According to Brad Walsh (2000), media coverage of the outbreak in Easlynn County was one of the main reasons food service industry vaccinated their food service workers.

Limitations:

There will be several factors that will limit the interpretation of the data. The first will be the response rate of the participants. This problem was demonstrated with the first round of surveys that were delivered to management in November 1999. One hundred surveys were delivered to food service managers and only eight responded. This response was corrected in 2000 when questionnaires were readministered to managers.

The second limitation with the study was that food handler classes were used to gather information. Food handler classes are traditionally for employees who have not worked in food service for many months. However, analysis of the data showed that there was a wide range of time that people had worked in food service. Some participants reported to have worked less than a week, whereas another individual stated they worked in food service for eighty-six. However, the main problem with the use of food handler classes was that food handlers that had heard about the hepatitis A

vaccination campaign during classes during prior to the vaccination campaign were not sampled. This is because food handlers only have to renew food handler cards once every three years.

Recommendations:

There are five recommendations that were determined from the results of this study. The first is that food service workers and daycare workers need to know more about the spread of hepatitis A and other food-borne illness. Continual efforts must be made to create useful teaching techniques for this target population.

The second is to encourage business to participate in vaccination campaigns by offering incentives. In the 2000 campaign one city offered free food service management courses, if a majority of food handlers were vaccinated from an establishment. A regulator from this city said there was a substantial increase in the number of individuals vaccinated due to this incentive than the previous year. Another incentive offered by one city was food handler permits and the vaccination at reduced rates. The State of Oklahoma incentive allows business not to pay taxes for one year if all employees are vaccinated against hepatitis A. These are some examples of incentives that might be offered to business to participate in hepatitis A vaccination.

The third recommendation is to research if Mexican immigrants, working in food service and daycare settings, need to be vaccinated against hepatitis A. As was discussed previously these types of vaccinations may be redundant in this target group.

The Fourth recommendation would be to explore more effective communication techniques with food handler day care workers and management. In addition explore why information was not transferred from management to employees.

The final recommendation may be more controversial. It is that the hepatitis A vaccination be required to work in food service or daycare facilities. The requirement should be considered due to the nature of the risk of this disease to the general public and the ease that hepatitis A can be spread. This recommendation is justifiable. If the vaccination becomes mandatory all the factors. If the vaccination becomes mandatory it should take the other four recommendations of this study into account. Requirement of the vaccination would be possible under current state law, which allows cities discretion in creating health practices to protect citizens. An example of this law regarding tuberculosis is in place in one city in north Texas. This city still requires that all food handlers be tested for tuberculosis. There is no basis for this requirement because tuberculosis is not spread by food, however the law has stood for many years. However such a law for hepatitis A has been shown that it would be justifiable. Currently, there is a state law under consideration by the Texas house and Senate to require hepatitis A vaccinations to work in food service.

Conclusions:

Food-borne illness will continue to be a problem in the United States due to the continuing trend of individual desire for fast ready to eat food. With the desire for fast ready to eat food increases the risk of spread of viral infection such as hepatitis A. Until hepatitis A becomes a required immunization for children, there is an increased risk for

spread of this disease to the general public from food service and daycare workers. One way to decrease this risk would be to vaccinate the group of food service workers and daycare workers against hepatitis A. Two recent vaccination campaigns in north Texas were attempted and in both campaigns low vaccination rates were noted.

From the results of this study it appears that dissemination of information about the campaign was one of the major problems with the success of the campaign. Another finding showed a need for education about the disease, especially among those participants that spoke Spanish. The third finding was that cost of the vaccine was a hindrance to the success of the campaign.

APPENDICES

APPENDIX A
MANAGER SURVEYS 1999

Survey for Hepatitis A for Food service manager

My name is Rebecca Bosarreyes and I am currently work with the City of Arlington health department. I am also working on my masters in Public Health at University of North Texas Health Science center. I am currently in a class that we must perform an actual community health assessment. I have chosen to study how to increase participation in Hepatitis A shot clinics offered by the health department.

Hepatitis A is a viral disease of the liver. It is easily spread and can make people very ill. It causes a lack of appetite, stomach pain and nausea, fever or yellowish skin. Most people are sick for less than 2 months. However there are some people who can be ill up to six months. An average person misses more than 5 weeks of work. Hepatitis A rarely causes death. However it can be a slow and painful disease. Several outbreaks of this disease have been linked to food handlers. That is why several health departments have encouraged restaurants to get Hepatitis A shots for their employees.

Several cities in North Texas chose to offer Hepatitis A shot for food safety month in September. Both the City of Arlington and the City of Ft. Worth participated in such shot clinics. The City of Ft. Worth and The City of Arlington had promising responses to these first clinics. To plan more informative campaigns that would encourage even greater response in the future, we have designed this survey.

Please help us by filling out the attached survey. It should take approximately fifteen (15) to twenty(20) minutes. There will be no way to identify you as a participant since we are not asking for any identifying information. Please return your survey in the stamped self addressed envelope provided with the survey. The results of this survey will be used to identify ways to offer better services to you and the public from the health department.

You are not obligated to fill out this survey, and your participation or decision to not participate will not effect your inspection score in any way.

If you have any questions about this survey please contact me Rebecca Bosarreyes, City of Arlington Health department 459-6767 ext. 7068.

Thank you for your participation.

Hepatitis A survey for Food Service Managers

Please complete the following survey and circle your answer.

1. How old are you?
 - a). 15-20
 - b). 20-30
 - c). 30-40
 - d). 40-50
 - e). 50 or above
2. How long have you worked in food service? _____Years _____Months
3. Do you think that food service workers should be concerned about Hepatitis A virus?
 - a). Yes
 - b). No
4. People get sick from the virus Hepatitis A by which of the following?
 - a). Coughing and then not washing hands.
 - b). Cross contamination of cooked foods with raw foods
 - c). Not washing hands properly after using bathroom.
 - d). All of the above
 - e). I am not sure how people get sick from this disease.
5. Did you know about the Hepatitis A Shot Clinics held for Food Safety Month in September?
 - a). Yes (**Go to question 6**)
 - b). No (**Go to question 11**)
6. Did you tell your employees about the shot clinics?
 - a). Yes (**Go to question 7**)
 - b). No (**Go to question 11**)
7. How did you tell your employees about the shot clinics? (i.e. letter, flyer)
8. Did you encourage your employees to get the shots?
 - a). Yes (**Go to question 9**)
 - b). No (**Go to question 11**)
9. Did you require your employees to get the shots?
 - a). Yes (**Go to question 10**)
 - b). No (**Go to question 11**)

10. If you answered Yes to number 9 please explain why?

11. Did you get your Hepatitis A shot in September?

(Please notice that we changed the order of yes and no for this question only)

a). No

(Please answer the questions on this side)
questions on this side)

12. Why did you not get the shot?
shot?

a) Price

b) Location

c) Time shots were given
accessible

d) Did not hear about clinic
take shot for work

e) To short notice
Hepatitis A and health

f) No transportation
explain

g) Other (**Please explain**)

13. Would you get the shot if you could?
about the shot clinics?

a). Yes

b). No

14. Would you be afraid to take such a shot?
the shot?

a). Yes

b). No

15. Would you take the shot if the
employees with you to get
health department required it?
the shot?

a). Yes

b). No

b). Yes

(Please answer the

12. Why did you get the

a). Price

b). Location

c). Times were easily

d). Was required to

e). Concerned about

f). Other (**Please**

13. How did you hear

14. Were you afraid to take

a). Yes b). No

15. Did you bring your

a). Yes

b). No

(Everyone please answer the following questions)

16. Do you think the Hepatitis A shot should be required?

- a) Yes b). No

Why? _____

17. What do you think is a reasonable price for the vaccine? **(Please remember shots costs \$25.00 per shot)**

18. Who do you think should pay for the shot, i.e. employee, employer, Health Department?

19. What is the best way to tell you about events such as the hepatitis A shot clinics?

- a) Newsletter
b) Mass mailing
c) Telephone call
d) Conversations with health inspector
e) Food handler classes
f) Other (please Explain) _____

**Thank you for filling out the survey,
we appreciate your participation.**

APPENDIX B

FOOD HANDLER AND DAYCARE WORKERS SURVEY 1999

Survey for Hepatitis A for Food Handler Class

My name is Rebecca Bosarreyes and I currently work for the City of Arlington health department. I am also working on my masters in Public Health at University of North Texas Health Science Center. I am currently in a class that we must perform an actual community health assessment. I have chosen to study how to increase participation in Hepatitis A shot clinics offered by the health department.

Hepatitis A is a viral disease of the liver. It is easily spread and can make people very ill. It causes a lack of appetite, stomach pain and nausea, fever or yellowish skin. Most people are sick for less than 2 months. However, there are some people who can be ill up to six months. An average person misses more than 5 weeks of work. Hepatitis A rarely causes death. However, it can be a slow and painful disease. Several outbreaks of this disease have been linked to food handlers. That is why several health departments have encouraged restaurants to get hepatitis A shots for their employees.

Several cities in North Texas chose to offer Hepatitis A shots for Food Safety Month in September. Both the City of Arlington and the City of Ft. Worth participated in such shot clinics. The City of Ft. Worth and The City of Arlington had promising responses to these first clinics. To plan for an informative campaign that would encourage even greater response in the future, we have designed this survey.

Please help us by filling out the attached survey. It should take approximately ten (10) to fifteen (15) minutes. There will be no way to identify you as a participant since we are not asking for any identifying information. Please return your survey to the attendant at the end of the session. The results of this survey will be used to better services from the health department.

You are not obligated to fill out this survey, and you will receive your food handler card regardless of whether or not you decide to participate.

If you have any questions about this survey please contact me, Rebecca Bosarreyes, at the City of Arlington Health Department 459-6767 ext. 7068.

Thank you for your participation.

Hepatitis A Survey for Food Handler Class

Please complete the following survey and circle your answer.

1. How old are you?
 - a). 15-20
 - b). 20-30
 - c). 30-40
 - d). 40-50
 - e). 50 or above
2. How long have you worked in food service? _____ Years _____ Months
3. Do you think that food service workers should be concerned about Hepatitis A virus?
 - a). Yes
 - b). No
4. People get sick from the virus Hepatitis A by which of the following?
 - a). Coughing and then not washing hands.
 - b). Cross contamination of cooked foods with raw foods.
 - c). Not washing hands properly after using bathroom.
 - d). All of the above
 - e). I am not sure how people get sick from this disease.
5. Did you know about the Hepatitis A Shot Clinics held for Food Safety Month in September?
 - a). Yes
 - b). No
6. Did you get your Hepatitis A shot in September?

(Please notice we changed the order of yes and no)

 - a). No
 - b). Yes

(Please answer the questions on this side)
questions on this side)

7. Why did you not get the shot?
 - a) Price
 - b) Location
 - c) Time shots were given
 - d) Did not hear about clinic
 - e) To short notice
 - f) No transportation
 - g) Other: **(Please Explain)**

(Please answer the

7. Why did you get the shot?
 - a). Price
 - b). Location
 - c). Times were easily accessible
 - d). Was required to take shot for work
 - e). Concerned about hepatitis A and health
 - f). Other **(Please Explain)**
-

8. Would you get the shot if you could?

a). Yes b). No

9. Would you be afraid to take such a shot? 9. Were you afraid to take the shot?

a). Yes b). No

10. Would you take the shot if the health department required it?

a). Yes b). No

8. How did you hear about getting the

a). Yes b). No

(Please go to question 11)

(Everyone please answer the following questions)

11. Do you think the Hepatitis A shot should be required?

a) Yes b). No

Why _____

12. What do you think is a reasonable price for the vaccine? (Please remember shots costs \$25.00)

13. Who do you think should pay for the shot (i.e. employee, employer, Health Department)?

14. What is the best way to tell you about events such as The Hepatitis Shot Clinics?

- a) Newsletter
- b) Mass mailing
- c) Telephone call
- d) Conversations with health inspector
- e) Food handler classes
- f) Other (Please Explain) _____

**Thank you for filling out the survey,
we appreciate your participation.**

APPENDIX C
SPANISH FOOD HANDLER SURVEY 1999

Encuesta sobre La Hepatitis A en una clase de encargados de servicio de comida

Mi nombre es Rebecca Bosarreyes. Trabajo para el departamento de salud de la ciudad de Arlington Texas. Tambien estoy estudiando para obtener me Maestria en Salud Público en la unversidad de North Texas Health Science Center.

Actualmente estoy tomando una clase en la cual debemos llevar a cabo una evaluación sobre salud comunitaria. Yo he decidio investigar cuál sería la mejor manera de incrementar la participación de la gente en las campañas sobre la vacunación en contra de la Hepatitis A, ofrecedas por el Departamento de Salubridad.

La Hepatitis A es una enfermedad del hígado. Ésta enfermedad se propago facilmente y hace que la gente se sienta muy enferma. La Hepatitis A causa falta de apetito, dolor de estómago y nausea, fiebre, decoloarcion amarilla en la piel y en la parte blanco de los ojos. En la Mayoria de los caso, la gente permance enferma menos de dos meses. Sinemabargo, en otros casos puede ser una lenta y dolorosa enfermedad. Algunas brotes de esta enfermedad hand sido relacionados con trabajadores encargados de manejo de comida. Por esta razón, algunos departamentos de salubridad han motivado a que los restaurantes provean a sus trabajadores con las vacunas encontra de la Hepatitis A.

Algunas ciudades del Norte de Texas han elegido el mes de Septiembre como el mes de la Seguridad Alimentica, ofreciendo campañas de vacunacion en contra de la Hepatitis A. Tanto la ciudad de Arlington como la ciudad de Fort Worth participaron en Las Campañas de vacunación. Esta cuidades hubo bastante participación en le Campaña de vacunación. Con el motivo de aumentar la participación en la futuro, hemos desarrollado ésta encuesta.

Por favor, ayudenos en nuestro objetivo llenando la encuesta. Esto le tomarà aproximadamente de 10 a 15 minutos. Su participación sera totalmente anónima, pues no estamos pidiendole ninguna identificacion. Por favor, devuelvale esta encuesta a la persona encardada al final esta sesión. Los resultados de ésta encuesta al final de esta sesión. Los resultados de ésta encuesta seran usados para mejorar los servicios del departamento de salubridad.

Usted no esta obligado a llenar esta encuesta, y usted recibira su tarjeta de encargado de servicio de comida aunque usted no haya llenado la encuesta.

Si tiene alguna pregunta acerca de esta encuesta, puede llarmarme . Mi nombres es Rebecca Bosarreyes, al Departemento de Salubridad de la ciudad de Arlington al 459-6767 ext. 7068.

Gracias por su participación.

**Encuesta relacionada a la Hepatitis A, en una clase
dirigida a los trabajadores de servicio de comida**

Por favor, complete la siguiente encuesta y trace un circulo alrededor de sus repuestas.

1. Cuánto años tiene usted?
a). 15-20 b). 20-30 c). 30-40 d). 40-50 e). 50 o mas
2. Cuánto tiempo ha trabajado usted en el servicio de comida? _____Años
Meses.
3. Piense usted que los Trabajadores de servicio de comida deben saber sobre el virus de la Hepatitis A
a). Si b). No
4. La gente se enferma al contraer el Hepatitis A por Medio de Cual de las siguientes formas?
a). Por no lavarse las manos, despues de taparse la boca al tocer.
b). Tocando carne cruda y despues tocando carne concida sin lavarse los manos.
c). Por no lavarse las manos adecuadamente despues de usar el baño.
d). Todas las repuestas son correctas.
e). No estoy seguro (a) de como la gente se enferma de Hepatitis A.
5. Se enteró usted de la campañas de vacunación en contra de la Hepatitis A, que se llevó a cabo durante el _____ mes de seguridad Alimenticia en el mes de Septiembre?
a). Si b). No
6. Obtuvo usted su vacuna contra la Hepatitis A en el mes de Septiembre?

(Note que hemos cambiado el orden de Si o No en esta pregunta solamente)

- a). No b). Si

(Por favor responda en este lado)

7. Por que **no se** vacuno contra la Hepatitis A?
Hepatitis A?

- a) Por el precio- muy caro
- b)
- c) Por la localización
- d)
- e) Por la hora en que las vacunas fueron dados
- f) Porque no se enteró de las campañas
- g) Porque se le informó tarde
- h) Porque no tuvo transportación
- i) Por otra razón **(Por favor explique)**

8. Se Vacunaria si pudiera?
sobre la
vacunación?

- a). Si
- b). No

9. Le daría miedo recibir esa vacuna?

- a). Si
- b). No

10. Se vacunaría si el Departamento
de salud lo pusiera como un requisito?

- a). Si
- b). No

(Por favor responda en este lado)

7. Por que **se** vacuno contra la

- a). El precio era conveniente
- b). Por la localización
- c). Porque el horario fue conveniente
- d). Porque fue un requisito en su trabajo
- e). Porque está conciente de la Hepatis A y la Salud
- f). Por otra razón
(Por favor explique)

8. Cómo se enteró de la Campaña

9. Le dió miedo recibir la vacuna?

- a). Si
- b). No

(Por favor, vaya a la pregunta 11)

(Por favor, todos deben responder las siguientes preguntas)

11. Cree usted que la vacuna contra la Hepatitis A debería ser un requisito?

- a) Si b). No

Porqué si o porqué no? _____

12. Cuál cree usted que sería un precio razonable por la vacuna? **(Por favor, recuerde que las vacunas cuestan \$25.00).**

13. Quién cree usted debería pagar por la vacuna? (Los empleados, los patrones, etc.)

14. Cual cree usted sería la mejor forma de infomarle sobre eventos tales como las campañas de vacunación en contra la Hepatitis A?

- a) Por Medio de boletines (periodicos)
- b) Circulares por Medio de Correo (Cartas)
- c) Por medio de llamadas telefónicas
- d) Por medio de conversaciones con Inspectores de salud
- e) En las clases de trabajadores encargados del servicio de comida
- f) Por otros medios (Explique) _____

**Gracias por haber llenado la encuesta
Apreciamos mucho su participación.**

APPENDIX D

PRE SURVEY FOR HEPATITIS A FOR MANAGERS 2000

Pre Survey for Hepatitis A for Managers 2000

My name is Rebecca Bosarreyes and I am currently work with the City of Arlington health department. I am also working on my masters in Public Health at University of North Texas Health Science center. As part of my studies in Public Health at the University of North Texas Health Science Center I am working on my thesis with Dr. Ximena Urrutia-Rojas, who is the primary investigator for this study. I have chosen to study how to better participation in Hepatitis A shot clinics offered by the health department.

Hepatitis A is a viral disease of the liver. It is easily spread and can make people very ill. It causes a lack of appetite, stomach pain and nausea, fever and jaundice. Most people are sick for less than 2 months. However there are some people who can be ill up to six months. An average person misses more than 5 weeks of work. Hepatitis A rarely causes death. However it can be a slow and painful disease. Several outbreaks of this disease have been linked to food handlers. That is why several health departments have encouraged restaurants to vaccinate their employees.

Several cities in North Texas chose to offer Hepatitis A shots as part of Food Safety Month in September 1999, and are continuing this shot clinics in September 2000. I am using opportunity to collect more data for my Thesis. Food Safety Month is held every September and is an opportunity to encourage Food Safety within the Food Service Industry and the General Public.

Please help me by filling out the attached survey. It should take approximately fifteen (15) to twenty(20) minutes. There will be no way to identify you as a participant since we are not asking for any identifying information. Please return your survey to the inspector at the end of your inspection in the attached enveloped. The results of this survey will be used to identify ways to offer better services to you and the public from the health department.

You are not obligated to fill out this survey, and your participation or decision to not participate will not effect your inspection score in any way.

If you have any questions about this survey please contact me Rebecca Bosarreyes, City of Arlington Health department 459-6767 ext. 7068.

Thank you for your participation.

Food Service and Day Care Mangers Hepatitis A Pre survey

Please circle the best answer

1. What is your Age?
a). 15-19 b). 20-29 c). 30-39 d). 40-49 e). 50 or greater
2. Are you a). Male or b). Female
3. Where you working in the Food Service or Day Care industry in North Texas in September of 1999?
a). Yes b). No
4. Did you hear about the Hepatitis A Vaccination Campaign for food handlers in September of last year?
a). Yes b). No
5. Did you or any of your employees participate in the Hepatitis A Vaccination Campaign in September of last year?
a). Yes b). No
6. How is Hepatitis A Spread? (Circle letter of best answer)
a). Improper washing of hands after using the bathroom
b). Improper cooling of food
c). Leaving food in the danger zone 41°F to 140°F for more than four hours
d). Blinking five times fast
e). All of the Above
7. Do you believe that the spread of Hepatitis A is important to the food service or Day care industry?
a). Yes b). No
8. Did you know about the Hepatitis A Shot Campaign held in Food Safety Month last year in September?
a). Yes b). No
9. Are you going to encourage your food handler or day care workers to get a Hepatitis A shot this year for Food Safety Month in September?
a). Yes b). No

Please explain why?

10. Who do you think should pay for the Hepatitis A shot?
 - a). Employee
 - b). Employer
 - c). City
 - d). Combo (Employer, employee and city, cost sharing)
11. Do you think that vaccinating food handlers and day care workers would be effective to stop the spread of Hepatitis A?
 - a). Yes
 - b). No
12. Do you think Hepatitis A shots should be mandatory for Food Service Workers and Day Care workers?
 - a). Yes
 - b). No

Please Explain why

13. What is the best way to tell you and your employees about events, like this vaccination campaign? **(Please circle all that apply)**
 - a). Mass mailing to your facility
 - b). Media, television, newspaper, radio
 - c). Food handler classes
 - d). Talking to health inspector
 - e). Other **(please explain)**

Thank you for your participation in the survey

APPENDIX E

POST SURVEY FOR HEPATITIS A FOR MANAGERS 2000

Post Survey for Hepatitis A for Managers 2000

My name is Rebecca Bosarreyes and I am currently work with the City of Arlington health department. I am also working on my masters in Public Health at University of North Texas Health Science center. As part of my studies in Public Health at the University of North Texas Health Science Center I am working on my thesis with Dr. Ximena Urrutia-Rojas, who is the primary investigator for this study. I have chosen to study how to better participation in Hepatitis A shot clinics offered by the health department.

Hepatitis A is a viral disease of the liver. It is easily spread and can make people very ill. It causes a lack of appetite, stomach pain and nausea, fever and jaundice. Most people are sick for less than 2 months. However there are some people who can be ill up to six months. An average person misses more than 5 weeks of work. Hepatitis A rarely causes death. However it can be a slow and painful disease. Several outbreaks of this disease have been linked to food handlers. That is why several health departments have encouraged restaurants to vaccinate their employees.

Several cities in North Texas chose to offer Hepatitis A shots as part of Food Safety Month in September 1999, These shots were offered again in September 2000 as part of Food Safety Month. Food Safety Month is held every September and is an opportunity to encourage Food Safety within the Food Service Industry and the General Public. I am using this opportunity to collect more data for my Thesis

Please help me by filling out the attached survey. It should take approximately fifteen (15) to twenty(20) minutes. There will be no way to identify you as a participant since we are not asking for any identifying information. Please return your survey to the inspector at the end of your inspection in the attached enveloped. The results of this survey will be used to identify ways to offer better services to you and the public from the health department.

You are not obligated to fill out this survey, and your participation or decision to not participate will not effect your inspection score in any way.

If you have any questions about this survey please contact me Rebecca Bosarreyes, City of Arlington Health department 459-6767 ext. 7068.

Thank you for your participation.

Food Service and Day Care Mangers Hepatitis A Post Survey

Please circle the best answer

1. Did you participate in the Hepatitis A Manager Pre Survey that was distributed in August of this year?
a). Yes b). No
2. What is your Age?
a). 15-19 b). 20-29 c). 30-39 d). 40-49 e). 50 or greater
3. Are you a). Male or b). Female
4. Where you working in the Food Service or Day Care industry in North Texas in September of 2000?
a). Yes b). No
5. Did you hear about the Hepatitis A Vaccination Campaign for food handlers in September of this year?
a). Yes b). No
6. Did you or any of your employees participate in the Hepatitis A Vaccination Campaign in September of last year?
a). Yes b). No
7. How is Hepatitis A Spread?
a). Not washing or inadequately washing hands after using the bathroom
b). Not cooling food rapidly
c). Leaving food in the danger zone 41°F to 140°F for more than four hours
d). Leaving dishrags in soapy water
e). All of the Above
8. Do you believe that the spread of Hepatitis A is important to the Food Service or Day care industry?
a). Yes b). No

Please explain why?

9. Did you know about the Hepatitis A shot clinics held for Food Safety Month in September?
- a). Yes (**Go to Question 10**) b). No (**Go to Question 14**)
10. Did you tell your employees about the shot clinics?
- a). Yes (**Go to Question 12**) b). No (**Go to Question 15**)
11. Did you encourage your workers to get the Hepatitis A Shot?
- a). Yes b). No
12. How did you tell your employees about the shot clinics?
- a). Flyer
b). Staff meeting
c). Posted notice on bulletin board
d). Other (**Please Explain**)
13. Did you require your employees to receive the shots?
- a). Yes b). No
(**Please explain why?**)
14. Who do you think should pay for the Hepatitis A shot?
- a). Employee
b). Employer
c). City
d). Combo (Employer, employee and city, cost sharing)
15. Do you think that vaccinating food handlers and day care workers would be effective to stop the spread of Hepatitis A?
- a). Yes b). No

16. Do you think Hepatitis A shots should be mandatory for Food Service Workers and Day Care workers?
- a). Yes b). No

Please Explain why

17. What is the best way to tell you and your employees about events, like this vaccination campaign? **(Please circle all that apply)**
- a). Mass mailing to your facility
b). Media, television, newspaper, radio
c). Food handler classes
d). Talking to health inspector
e). Other **(please explain)**

Thank you for your participation in the survey

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