

THE INCIDENCE OF BREAST CANCER AMONG DOMESTIC AND  
INTERNATIONAL FLIGHT ATTENDANTS

A DISSERTATION

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

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IN THE GRADUATE SCHOOL OF THE

TEXAS WOMAN'S UNIVERSITY

COLLEGE OF HEALTH SCIENCES

BY

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DENTON, TEXAS

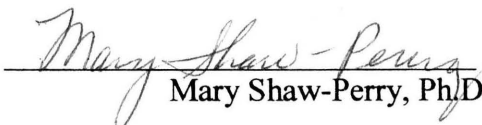
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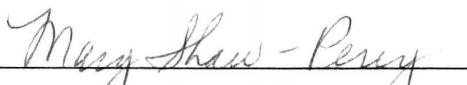

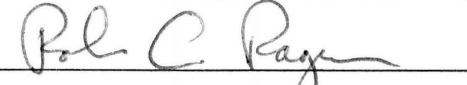

April 16, 2001

To the Dean of Graduate Studies and Research:


I am submitting herewith a dissertation written by Judy B. Spira entitled "The Incidence of Breast Cancer Among Domestic and International Flight Attendants." I have examined this dissertation for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy with a major in Health Studies.

  
Mary Shaw-Perry, Ph.D.

We have read this dissertation and recommend its acceptance:

  
  
  
  
Chair, Department of Health Studies

Accepted:

  
Dean of Graduate Studies and  
Research



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## DEDICATION

*This dissertation is dedicated to my mother-in-law Betty Van Sevenant and my late father-in-law Joseph Spira.*

*Betty survived 38 months (1,145 days) of captivity in the concentration camps at Mauthausen and Ravensbruck. She was liberated April 22, 1945, not having to "come out through the crematorium's chimneys" as so many others did.*

*Joseph survived 36 months of captivity in the concentration camps at Auschwitz and Buchenwald. Arrested by the Gestapo, at the end of July 1942, along with his father, his 3 sisters, his brother and his brother-in-law, he was the only one to survive the camps.*

*Betty is always strongly moved by the "Chant de la Liberté" sung to the music of Giuseppe Verdi's*

*"Va pensiero, sull' ali dorate" from his Opera Nabucodonosor.*

*She feels the song is a beautiful and poignant symbol of the prisoners suffering and enduring spirit in the camps.*

*Joseph was a violinist, and to him the 3<sup>rd</sup> movement of Johann Sebastian Bach's Sonata No. 2 in A minor for solo violin was always felt as a sacred prayer.*

*Joseph and Betty weighed less than 80 pounds when they were finally liberated from the camps.*



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My immense gratitude to Jim and Toni Fitzgerald for their continual support and love not only during this research process but for the past 20 years. They have been a treasure both personally and in this academic endeavor. I would also like to recognize my fellow researchers who supported my search for information and who collected, distributed, advised, and counseled me in all aspects with this population: Patt Gibbs, T.J. Norris, Leanne Olds, and Tina Bovine. A very special thank you to Lynda Owen and Nancy Candelaria. I give my eternal thanks for their expert input and corrections with regard to the evolving manuscript within an impossible and ever-changing time frame, to a dedicated statistician and teacher Darla Emerson I thank you for your long drives and late hours working with me on this dissertation, my thanks to Kate Victory for her gentle guidance and invaluable suggestions, my gratitude to two fine research librarians - Connie Maxwell and Greg Hardin. I am deeply appreciative of your creative efforts and eagerness to assist me in any way possible with my research efforts in our university library.

To my beaux frere, Niv Garti, in Brussels, Belgium who worked with me to develop the online survey and the initial concepts related to my research I give my undying appreciation and most sincere thanks. He has worked with me diligently and patiently to enhance the progress and successful completion of my research study and dissertation. Thank you, Niv, for your wit, your skills, and your patience with une belle soeur!

To my family, Chris and Katie, I thank them for their support on the home front during this process. They have both experienced the ongoing process of my studies and national seminar presentations that often take me away from home throughout my education and through this final phase of the doctoral program of studies.

I would like to extend a special “thank you” to all the flight attendants who voluntarily participated in this breast cancer survey and who hope, as do I, that a cure soon becomes a reality.

COMPLETED RESEARCH IN HEALTH SCIENCES, Texas Woman's University,  
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The purpose of this study was to determine whether the incidence of breast cancer is different between female flight attendants and women in the U.S. population, and between domestic and international flight attendants. The sample used for this study was full and part-time employed flight attendants at commercial airlines in the United States. The instrument used to collect data for the study consisted of the Spira Online Flight Attendant Survey (SOFAS), available in an online and printable version, developed by the researcher. Participants were profiled based on age, gender, ethnicity, menarche, age at first child's birth, clinical diagnosis of breast cancer, unilateral or bilateral mastectomy, and first-degree relative history of breast cancer. Flight variables considered were Flight Schedule, Type of Aircraft, Average Hours Flown per Month, Flight Duration and Altitude, and Base City. A total of 414 completed surveys, 190 responses from domestic flight attendants (45.9%) and 224 international flight attendants (54.1%) were used for the data analyses. The results of the study indicated there was no statistically significant difference in the incidence of breast cancer between domestic and international flight attendants.

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## CHAPTER I

### INTRODUCTION

#### Statement of the Problem

A review of the literature revealed that few studies have been done to determine the etiology of the increased breast cancer rates in flight attendants when compared to the general population. As a result of this gap in knowledge, there is widespread controversy concerning several theories as possible causative factors. There is not only an industry-wide need for information relative to this research, but there is also a lack of preventive programs and measures within the airline industry, including components for education, risk reduction, and screening programs that may be tailored to the flight attendant population.

Breast cancer and the severity of complications that develop secondary to the disease represent a major health problem. This year, approximately 182,800 women in the United States will be diagnosed with invasive breast cancer, and approximately 40,800 women will die from breast cancer (American Cancer Society [ACS], 2001). This exploratory research study can be used to guide the design of health education and promotion programs for all flight attendants who are at risk for developing breast cancer within the airline industry.

## Rationale

Breast cancer continues to be a serious public health problem both domestically and internationally. In the United States, breast cancer ranks second among cancer deaths in women (ACS, 2000). Because many countries do not have national incidence rates, or only have rates for specific regions, there are fewer countries represented in the incidence data than in the mortality data (U.S. Department of Health and Human Services [USDHHS], 1996). In many parts of world, dramatic shifts in cancer occurrence are being observed by the World Health Organization (WHO) 1998. The World Health Organization also states that for all countries, breast cancer is the most common cancer found in women. There are a number of risk factors that are linked to the development of breast cancer. For example, women who have a first-degree relative (sister, mother, or daughter) with a history of breast cancer have about a two-fold increased risk of developing breast cancer (ACS, 2001). Additionally, cancer risk may increase from exposure to possible environmental factors, such as radiation (ACS, 2001).

A population that appears to be at risk for developing breast cancer due to occupational exposure is flight attendants. Cancer incidence was studied among 1,764 Finnish flight attendants who received a dose of approximately 2 milliSieverts per year from cosmic radiation (Pukkala, Auvinen, & Wahlberg, 1995). Female cabin attendants had a significant, 1.9 fold incidence of breast cancer compared to the national average. The study completed in Finland raises questions about the incidence of breast cancer among flight attendants who are continually exposed to low doses of ionizing radiation.

During the last decade, many theories have been examined in attempts to identify possible environmental causes for the increased incidence of breast cancer among flight attendants. The Federal Aviation Administration (FAA) acknowledged in 1992 that pilots and flight attendants may receive more radiation annually than the average radiation worker, perhaps up to twice as much relative to altitude U.S. Department of Transportation (USDOT, 1994). The annual radiation exposure of a typical flight crew member is comparable to the exposure of a traditional radiation worker (i.e., nuclear power plant) in the United States. Radiation exposure doubles with every 6,500 feet of altitude, and solar flares can increase radiation exposure 10 to 20 times (Barish, 1996).

New technology, such as the dosimeter that measures in-flight radiation, has redirected attention to the long-term cumulative effects of low-level ionizing radiation to those people who are engaged in high-altitude, long-duration flights (Barish, 1996). This leads to the question of whether female flight attendants who are engaged in high-altitude long-duration flights have an increased incidence of breast cancer compared to women in the general population.

### Purpose of the Study

The purpose of this study was to determine whether the incidence of breast cancer is different between female flight attendants and women in the U.S. population, and between domestic and international flight attendants.

## Hypotheses

The null hypotheses for this study were as follows:

H<sub>0</sub>1: There is no significant difference in the incidence of breast cancer between female flight attendants and women in the U.S. population.

H<sub>0</sub>2: There is no statistically significant difference in the incidence of breast cancer between domestic and international female flight attendants.

H<sub>0</sub>3: There is no statistically significant difference in the incidence of breast cancer between international female flight attendants and women in the U.S. population.

H<sub>0</sub>4: There is no statistically significant difference in the incidence of breast cancer between domestic female flight attendants and women in the U.S. population.

## Definition of Terms

1. Breast Cancer. A cancer, or abnormal growth of cells, located within the breast tissue of either males or females (ACS, 2001).
2. Domestic Flight Attendant. A cabin crewmember of a commercial airline flying domestic routes (within the continental United States) for a shorter duration (less than six hours) and at a lower altitude (less than 35,000 feet) than flown by international flight attendants.
3. Ionizing Radiation. Any radiation, as a stream of alpha particles or x-rays, that dissolves or becomes altered as it passes through a medium (Barish, 1996).
4. International Flight Attendant. A cabin crewmember of a commercial airline flying routes between nations of altitudes in excess of 35,000 feet and of durations of six or more hours.

5. Radiation. The complete process in which energy is emitted by one body, transmitted through an intervening medium or space, and absorbed by another body. During this exposure, energy is transferred from the radiation into the material (Barish, 1996).

6. Sievert. The sievert is a measure of the biological harm that ionizing radiation might cause. It is most commonly expressed in milliSieverts (USDOT, 1994).

7. Spira Online Flight Attendant Survey (SOFAS). A survey developed by the researcher that will provide a baseline to compare the incidence of breast cancer among commercial female flight attendants and women in the U.S. population, and between domestic and international flight attendants.

#### Limitations

The limitations of this study were as follows:

1. The study was limited in scope due to the convenience sample; therefore, generalizability was impacted.
2. The study was limited in scope to the setting from which the sample was obtained; therefore, generalizability was impacted.
3. Only currently employed commercial flight attendants were surveyed; therefore, generalizability was decreased.

#### Delimitations

The study was delimited by the following:

1. The sample consisted of commercial airline female flight attendants between 20 and 80 years of age.

2. Flight attendants who reported less than five years of experience were not included in the data analysis.

3. The study included only female flight attendants who completed either the online or the printed survey during the designated time period.

### Assumptions

The assumptions in this study were as follows:

1. All flight attendants in the sample answered questions on the self-report online questionnaire or the newsletter survey honestly and to the best of their ability.

2. All flight attendants in the sample had documented knowledge of hours flown on specific aircraft during their career.

3. All flight attendants had sufficiently accurate recall of the number of hours flown on specific aircraft during their career.

4. Both male and female flight attendants completed the online or the newsletter survey.

### Significance of the Study

An increasing number of studies have been conducted on in-flight radiation, especially relative to commercial airline flight attendants and breast cancer. One of the major reasons for this increased research focus is the growing international concern that in-flight radiation is a risk factor associated with breast cancer and that long-term occupational exposure to ionizing radiation affects flight attendants. According to Boice, Blettner and Auvinen (2000), exposure assessment for pilots is reasonably good because of the completeness of flight records and the computer programs now available to



account for exposures at different altitudes and latitudes. Exposure assessment for cabin crew is a bit more problematic because their flight history records are usually discarded within a few years and most aircrew fly a wide variety of routes in a given year (Boice, Blettner, & Auvinen, 2000). Other reasons for studying the relationship between breast cancer and in-flight radiation are to better understand in-flight radiation exposures, and to obtain accurate measurement of these exposures.

Breast cancer studies of flight attendants have examined different possible etiological factors such as ionizing radiation (Pukkala, Auvinen, & Wahlberg, 1995), melatonin hormone levels (Mawson, 1998), and a possible pesticide factor (Wartenberg & Stapleton, 1998). In 1995, Pukkala, Auvinen, and Wahlberg performed a design-record linkage study in Finland composed of 1,577 female and 187 male cabin attendants. The results indicated a significant increase of breast cancer and bone cancer found in female flight attendants compared to the Finnish cancer registry of the general population (Pukkala, Auvinen, & Wahlberg, 1995). Unpublished research being conducted by Peggy Reynolds has linked a large, well-defined cohort of flight attendants with the state-of-the-art population-based statewide cancer reporting system maintained by the California Cancer Registry to see if the same breast cancer risk relationship is evident as was identified by researcher Euro Pukkala and his colleagues (Reynolds, n.d.).

Current protection standards in the United States for environmental and occupational exposures to ionizing radiation are mainly based on estimates of radiation-induced cancer risks derived from studies of atomic bomb survivors in Hiroshima and Nagasaki, Japan, and for patients irradiated for therapeutic purposes (Mawson, 1998).

Further research is necessary to ensure a safe work environment and to identify environmental factors that may cause cancer in the general population (Barish, 1996).

European and Canadian regulatory agencies have been more concerned about radiation exposure to flight crews than the Federal Aviation Administration of the United States. Effective May 13, 2000, the European Council Directive 96/29 required that carriers in the European Union [EU] take the following steps to manage radiation exposure among flight crew: 1) determine which flight segments are likely to result in radiation exposure exceeding established standards; 2) set up methods to measure effective doses of radiation for individual crew members; 3) inform crew members of possible health risks; and 4) ensure that the fetus receives no more than the acceptable exposure after the crewmember declares pregnancy (European Union Council, 2000). Workers occupationally exposed to radiation and managers of the EU employees are to receive instruction on possible health effects associated with such exposure as well as learn the appropriate actions to take to minimize this exposure (USDOT, 1990).

Furthermore, according to Mawson (1998), electromagnetic exposure may increase the risk for breast cancer. In *Aviation Space Environmental Medicine*, the researchers reported a meta-analysis search for published and unpublished cohort studies of types of cancer among flight personnel from 1986-1998. Their conclusion was that flight personnel appeared to be at increased risk for several types of cancer (Ballard, Lagorio, De Angelis, & Verdecchia, 2000). Wartenberg and Stapleton (1998) note that another possible link to the increase in flight attendant breast cancer could be the amount of pesticides containing the known carcinogen DDT regularly sprayed onboard aircraft.

Clearly, it is important to develop additional public health screening tools, and guidelines to systematically update and refine current scientific methodology related to in-flight radiation research. With the active development of a new generation of supersonic airplanes that fly at higher altitudes, the issues of altitude, latitude, and flight duration will become more important elements placing flight attendants at possible increased risk for developing breast cancer (Barish, 1996). This is a powerful reason to regularly survey and study the flight crew population.

## CHAPTER II

### REVIEW OF LITERATURE

A review of the literature was conducted to establish a need for the proposed research. Consistent with the current emphasis on cancer prevention and control and the continued interest in occupational cancers, this chapter presents findings from a review of the literature, 1987 through 2001, concerning (a) breast cancer in the United States, (b) flight attendant characteristics, (c) European flight attendant cancer research, (d) American flight attendant cancer research, (e) evidence of cancers related to radiation exposures, (f) medically-induced cancer, and (g) radiation regulatory agencies.

#### Breast Cancer in the United States

Breast cancer is the most commonly diagnosed cancer and the second leading cause of cancer deaths among American women (WHO, 2001). This year, approximately 182,000 women in the United States will be diagnosed with invasive breast cancer, and approximately 40,800 women will die from breast cancer (ACS, 2001). After increasing about 4% per year in the 1980s, breast cancer incidence rates in women have leveled off in the 1990s to about 110.6 cases per 100,000 (ACS, 2001). The biggest risk factors are being a woman and aging as well as a family history of breast cancer, early onset of menstrual periods or a late menopause, and never having children or having a first child after age 30 (ACS, 2001). These factors may account for up to one-half of all female

breast cancer cases and are likely to be associated with the occupation as a female flight attendant (Ballard et al., 2000).

### Flight Attendant Characteristics

The characteristics of flight attendants have changed markedly in the last seven decades. The first flight attendants were hired by United Airlines in 1930 and by American Airlines in 1933 (Mahler, 1993). Clearly, the beginnings of the flight attendant profession has expanded into a large profession that still is primarily composed of women.

In 1997, there were over 187,875 flight personnel working for United States airlines, including over 105,366 flight attendants, male and female Air Transport Association [ATA], 1999. Most flight attendants are women, and many of them are of childbearing age (Goldhagen, 2000).

Flight attendants also appear to marry later than the general population and to bear fewer children, or remain childless (AFA, 2001). Other occupational factors include irregular working hours, alteration of circadian rhythms due to flying over many time zones in short periods of time, chronic fatigue, disturbance of ovarian function, inadequate diet, and psychological demands and associated stress (Boice, Blettner, & Auvinen, 2000). For flight attendants there is also the possibility of prolonged standing and lifting as well as noise and hearing problems, cabin altitude and related anoxia and low humidity and temperature changes (Boice, Blettner, & Auvinen, 2000). Clearly, cosmic radiation, then, is not the only occupational factor of potential concern nor is

cancer the only potential disease/illness that might be associated with flight (Boice, Blettner, & Auvinen, 2000).

In addition, flight attendants typically work full or part-time, and many commute to different “bases” or “hubs” which are frequently different than the cities in which they claim legal residence (Mahler, 1993). Flight attendants have recently been studied by researchers examining the incidence and the mortality rates of different occupational cancers. These research studies have found an increase in specific cancers for both the flight attendant and the cockpit crews (Pukkala et al., 1995). Exposure assessment for pilots is reasonably good because of the completeness of flight records and the computer programs now available to account for exposures at different altitudes and latitudes (Boice, Blettner, & Auvinen, 2000). Exposure assessment for cabin crew is a bit more problematic because their flight history records are usually discarded within a few years and most aircrew fly a wide variety of routes in a given year (Boice, Blettner, & Auvinen, 2000). United States flight crew exposures to natural cosmic radiation are not regulated or typically monitored (Waters, 2000).

In summary, recent research has revealed an apparent increase of breast cancer within the flight attendant population compared to the general population. While the increased cancer risks found here may be explained by well-known risk factors, they may also be due to unmeasured occupational exposures specific to flight personnel (Ballard et al., 2000). It may also be surmised that those employees working on the most commonly traveled high latitude/altitude routes are among the most highly exposed occupational groups (Wilson, 2000). Efforts to identify and clarify cancer risks associated with the

workplace continue. This research is necessary to ensure a safe work environment and to identify environmental factors that may cause cancer in the general population (USDHHS, 1996).

### European Flight Attendant Cancer Research

#### The Finnair Study, 1995

A recent study in Finland sought to determine whether occupational exposure among cabin attendants is associated with an excess risk of cancers related to radiation (Pukkala et al., 1995). Pukkala identified all cabin attendants who had ever worked for the Finnish flight companies and had not died before January 1, 1967 from the files of the Finnair Flight Company.

The researchers counted the number of observed cases and person years at risk separately for three periods of time (1967-75, 1976-84, and 1985-92) by five-year age groups. They calculated the expected number of cases of cancer overall and for specific average incidence of cancer in the entire Finnish population during the period of observation. They divided the subjects further, by time elapsed since recruitment and by time spent at work. In the latter case, the follow-up started at the date when the person had been working the required time as a cabin crew member (Pukkala et al, 1995). The specific cancers selected “a priori” for the analyses comprised cancers related to radiation and other common cancers, to yield the whole picture of cancer among Finnish cabin attendants (Pukkala et al, 1995).

In all, 187 men and 1,577 women were followed up by Pukkala and his research team. The mean length of follow-up for a person was 13.9 years. More than one-third of

the participants were below 30 years and a few were older than 60 years of age (Pukkala et al.,1995). Women in the study reported 35 cancers which was higher than the expected number of 28.4. Their standardized incidence ratio for breast cancer was 1:87 with a 95% confidence interval of 1.15 to 2.23 (Pukkala et al.,1995). According to Pukkala and his researchers, estimates of the potential health hazards due to radiation exposure have been published, but so far no empirical studies on the risk of cancer among cabin attendants (members of cabin crews) have been studied.

#### Danish Study, 1990

In Denmark, the incidence of cancer has been monitored for 17 years for the cohort of participants in the 1970 census. The standardized incidence ratio was calculated for each occupational group on the basis of the incidence for all economically active people (Lynge, 1996). The standardized incidence ratio for breast cancer in the Danish female cabin attendants is 1:61 while in all Danish women with similar backgrounds, the ratio was 1:40 (Lynge, 1996). The Danish data thus support the Finnish observation that the risk of breast cancer in female airline cabin attendants is higher than that for all women with similar backgrounds (Lynge, 1996).

#### American Flight Attendant Research

#### New Jersey Study, 1998

Another hypothesized risk factor for breast cancer is exposure to organochlorine pesticides, pertinent to flight attendants who in past decades have been exposed to mandatory spraying of the aircraft cabin on arrival in certain countries (Wartenberg & Stapleton, 1998). Pesticide spraying still does occur in New Zealand, Australia, Africa,



and South America (AFA, 2001). Wartenberg and Stapleton (1998) used a self-reported number of flights on which pesticides were sprayed to evaluate risk of breast cancer, among flight attendants.

#### Melatonin Study, 1998

Yet another possible risk factor for breast cancer among flight attendants arises from the disruption of circadian rhythms due to flying in many time zones. Melatonin may have a protective effect against cancer development, especially in hormone-dependent tumors, and disruptions in sleep-waking cycles may lead to an increase in cancer risk by suppressing melatonin secretion (Mawson, 1998). An epidemiologic study of totally blind, and severely visually impaired persons found reduced cancer incidence for breast and prostate among the totally blind compared with a standard population, but not among the partially blind, suggesting that only the total absence of light results in a free-running melatonin cycle, and thus protects against cancer (Feychting, 1998).

#### Cancer Incidence in California Flight Attendants

A recent project, a collaboration between the California Department of Health Services' Environmental and Occupational Health programs and the Association of Flight Attendants (AFA), was designed to provide an initial evaluation of the incidence of cancers of the breast and other sites among California cabin crews (Reynolds, n.d.). For these AFA members, statewide population-based cancer incidence information was collected for a seven-year period, 1988–1994.

Records for the California residents were matched to the statewide population-based cancer registry to identify the cancer diagnoses concurrent with 1988-1994

employment (Reynolds, n.d.). During this time a total of 129 newly diagnosed cancers occurred among these active AFA members; 117 of these occurred among females, and 12 among males. Of the total, 91 were invasive cancers, and 38 were in-situ. The most commonly occurring tumor was cancer of the female breast, with 45 invasive and 9 in-situ cases (Reynolds, n.d.).

If risk associations for breast cancer or other radiation-associated cancers appear to be high in this study of flight attendants, it can serve as the basis for more in-depth studies of cancer risk factors in flight personnel (Reynolds, n.d.). Even the limited data that will be available from this study when published will represent the largest such study of flight attendants conducted to date, and will hopefully help inform future health-related studies of flight crews (Reynolds, n.d.).

### Meta-Analysis

In a recent meta-analysis the researchers hypothesize that exposure to cosmic radiation and other physical or chemical agents may pose health risks for flight personnel. Ballard and his fellow researchers performed an exhaustive search for published and unpublished cohort studies of flight personnel from 1986 – 1998. This study included two incidence studies of flight attendants, using standard meta-analytic methods (Ballard et al., 2000).

Among female flight attendants, both studies showed increased risks compared with standard populations for all-sites cancer, malignant tumors of the colon or breast, and melanoma (Ballard et al., 2000). Results from two flight attendant studies were combined for all-sites cancer, breast cancer, and malignant melanoma of the skin.

Excesses were seen for all sites with the strongest finding for melanoma (Ballard et al., 2000). Correcting the single cancers for socioeconomic status, the combined relative risks remained elevated. These findings suggest that more than 22% of all cancers, 35% of melanomas, and 26% of breast cancers may be attributable to occupation as a flight attendant (Ballard et al., 2000).

The purpose of the research was to combine the evidence from the small number of available flight crew studies as a background rationale for further research (Ballard et al., 2000). While the increased cancer risks found in this research may be explained by well-known risk factors, they may also be due to unmeasured occupational exposures specific to flight personnel (Ballard et al., 2000).

#### Evidence of Cancers Related to Radiation Exposure

The majority of the public in industrial countries believe that pollution and low doses of radiation are threats to good health (Tubiana, 2000). Fearful public concern about radiation began in 1955, with the beginning of the Cold War, when the possibility of a nuclear holocaust appeared very real (Tubiana, 2000).

Radiation does not act entirely in isolation. It can interact with other carcinogens, e.g., tobacco or chemotherapeutic agents, and with a host of other factors such as age at exposure, gender, or reproductive history (Ron, 1998). “There is considerable uncertainty about radiation-induced health risks for aircrews,” states Dr. Wallace Friedberg of the United States Federal Aviation Administration. “We do not have adequate information about the health effects of the high-energy radiations to which aircrews are exposed”, (W. Friedberg, personal communication, March 28, 2001).

### Deadly Glow Study, 1920

The radium dial worker tragedy recounts the events surrounding radium dial workers in the 1920's, who between the ages of 11 years and 45 years of age, suffered painful disabilities, disfigurements, and death from ingesting small amounts of radium paint as they tipped their paint brushes between their lips to form a fine brush stroke painted on watches and gauge dials (Mullner, 1999). This classic study of women who painted radium dials before 1930 showed high rates of bone sarcomas and head cancers. They had swallowed large quantities of radioactive radium by licking their paintbrushes to make fine painting tips; it has been estimated that the average dose reaching their bone tissues was very high (USDHHS, 1996). These deaths would provide a vital warning to World War II's most important military project (Mullner, 1999).

### The Atomic Bomb Study, August 1945

Epidemiological studies provide the primary data on the carcinogenic effects of radiation in humans. Much of what is known has come from the studies of the atomic bomb survivors, and to a lesser extent from patients receiving radiotherapy (Barish, 1996). There is only one relatively large population that contains people who received a variety of radiation doses during a single well-documented event (Barish, 1996). This is the population of approximately 90,000 survivors of the atomic blasts at Hiroshima and Nagasaki (Barish, 1996). The most common effect seen in the bomb survivors is cancer. Female survivors who received a single dose of radiation from the blast were found to be at the same risk for breast cancer as women with tuberculosis who had experienced repeated fluroscopy exposures over a three to five year period (USDHHS, 1996). This

suggests that in the case of breast cancer, but not necessarily other cancers, repeated small doses over the years may be as hazardous as a single, large dose (USDHHS, 1996). Cancer in this irradiated population is much more frequent than in Japanese of the same age who were not exposed to radiation from the atomic bomb. It has taken a long time to collect this information because cancer can be produced 30 or more years after the irradiation that caused it (Barish, 1996). Ultimately, the studies of the radium dial workers, along with those of the Japanese atomic bomb survivors, would form the basis of much of the world's present knowledge of the health risks of radioactivity (Mullner, 1999).

#### Chernobyl, Russia Study, 1986

There are other environmental and occupational exposures to radiation. Radioactive fallout, for example, is produced during nuclear weapons tests when airborne radioactive particles settle to the ground (USDHHS, 1996). One study showed that persons accidentally exposed to very high levels of fallout had an increased risk of thyroid cancer (USDHHS, 1996).

There have been many reports of an increase in the incidence of some diseases as a result of the April 25, 1986 Chernobyl accident (NEA, 2001). The U.S. Nuclear Energy Agency also stated that the primary groups of interest for study are the 237 people who suffered from acute radiation syndrome (ARS), the 15,000 people who lost their ability to work owing to disease, the 12,000 children who received large doses to the thyroid gland, and the 9,000 children who were irradiated in utero. There are no documented cases of

cancer in patients with ARS, though study groups of irradiated children have shown incidences of thyroid cancer (NEA, 2001).

These studies demonstrate that exposure to moderate to high doses of radiation increases the risk of cancer in most organs. For all solid cancers combined, cancers of the thyroid, breast and lung, and leukemia, risk estimates are fairly precise, and associations have been found at relatively low doses. In general, the breast, thyroid, and bone marrow are most sensitive to the effects of ionizing radiation (USDHHS, 1996), and there may be a minimum time lag after exposure of about two years before leukemia develops and 10 to 15 years before other cancers develop.

Efforts to identify and clarify cancer risks associated with the workplace continue. This research is necessary to ensure a safe work environment and to identify possible environmental factors that may cause cancer in the general population (USDHHS, 1996).

#### Radiation Technologists Study, 1998

The possible mortality risk from low-level chronic exposures to ionizing radiation was evaluated among 143,517 United States radiologic technologists certified by the American Registry of Radiologic Technologists between 1926 and 1990 (Doody, 1998). This is one of the few occupational studies of primarily women (73%) were exposed to radiation during their employment. More than 2.8 million person-years of follow-up were accrued through 1990, and 7,345 deaths were identified. Relative to the general population, the standardized mortality ratio (SMR) for female breast cancer was significantly elevated relative to all other cancers in a test of homogeneity (Doody, 1998).

## Medically Induced Cancers

From the 1920's through the 1950's, radiation therapy was used in Sweden as a treatment for benign breast diseases ( Mattsson, Ruden, Hall, Wilking, & Rutqvist, 1993). Total dose, age at first exposure, and time since first exposure were all determinants of the incidence rate ratio of breast cancer after exposure of the breast to ionizing radiation. A statistically significant increase in the incidence of breast cancer following radiation treatment of various benign breast diseases was observed even among women older than 40 years at the time of first treatment (Mattsson et al., 1993).

The breast is a known radiosensitive organ, and elevated rates of breast cancer have been demonstrated among atomic bomb survivors (greatest among women exposed before age 20) and among women receiving radiation therapy for various medical reasons (Ballard et al., 2000). It is of importance both to flight personnel and to frequent flyers to determine if their risk of cancer is elevated from the potentially harmful effects of ionizing radiation in the form of cosmic rays and whether current occupational standards provide sufficient protection (Ballard et al., 2000).

## Radiation Regulatory Agencies

Government standards for radiation protection are established by the National Council on Radiation Protection and Measurement (NCRP) and its international counterpart, the International Commission on Radiological Protection (ICRP, 1997). Both of these organizations offer recommendations for the maximum permissible dose (MPD) of radiation to which people should be exposed, and those recommendations are

generally adopted by various government regulatory agencies (e.g., Federal Aviation Administration [FAA], Environmental Protection Agency [EPA], Occupational Safety and Health Administration [OSHA], and the National Radiation Council [NRC]) as the maximum limits permitted by law (ICRP, 1997). Current MPD rates are shown below:

	<b>NCRP</b>	<b>ICRP</b>
General Public:		
Annual MPD	1 mSv	1 mSv
Radiation Workers:		
Annual MPD	50 mSv	20 mSv
Cumulative MPD	10 mSv x age	---
MPD during Pregnancy	5 mSv	2 mSv

The present state of governmental regulations is that acceptable doses of radiation for both the general public, flight crew, and particularly pregnant females, are continually declining. Crew members are occupationally exposed individuals who can receive significant annual radiation doses as a consequence of their employment, but have virtually no information to help them assess the risks (Barish, 1996).

There are very few regulatory agencies, either national or international, that have set radiation limits for the general public and for flight crews. The NCRP (National Council for Radiation Protection) and the ICRP (International Council for Radiation Protection) are two such agencies that have developed recommended limits of estimations of radiation (DOT, 1994). The FAA has informed U.S. airlines it is their responsibility to inform flight crews, both pilots and flight attendants, of radiation estimations and hazards inherent within the occupation. The FAA has also provided flight



crews with a computer program that will estimate radiation received by entering specific flight information (i.e., departure city, arrival city, flight altitude, and duration). The CAMI-6 computer program calculates the estimated radiation received for each crew member as entered by the crew member (DOT, 1994).

The FAA documented to commercial airlines that it is their responsibility to inform flight personnel of risks and to provide them with ways to reduce risks to in-flight radiation (DOT, 1990). The FAA has also notified airlines that they are advised to provide flight crews with recommendations concerning radiation exposure (DOT, 1994).

#### Employee Health and Safety

In the past workers, workers were rarely told about the harmful material to which they were exposed (Mullner, 1999). Under OSHA's regulations, employers are now required to inform workers of the presence of all hazardous chemicals and toxic substances (Mullner, 1999). Employers also must label all hazardous substances; train workers in the proper means of handling them; develop a written hazardous communication program; and have a material safety data sheet for each hazardous substance they use (Mullner, 1999).

In 1975, the FAA established that it, not OSHA, should regulate the health and safety of airline workers. The FAA formally recognized cosmic radiation as an occupational exposure for flight crewmembers in 1990 when it published a list of different exposure levels expected on varying flight routes Department of Transportation <http://www.bts.gov/ntl/DOCS/Ac12052.html>). In 1994, the FAA published another document that recommended that the airlines provide crewmembers with educational

materials that describe potential exposures and health risks Department of Transportation <http://www.faa.gov/avr/afs/radiation.doc>). To date, American Airlines is the only airline to have complied with this recommendation (AFA, 2001).

Many workers, however, do not know what hazardous substances they are exposed to, nor do they recognize the illness they are suffering is work-related (Mullner, 1999). Unlike most American workers, flight attendants are not provided with the same health and safety protections. Flight attendants are not covered by OSHA (Mullner, 1999).

In Washington, D.C. on December 12, 2000, a report was issued by the Federal Aviation Administration/Occupational Safety and Health Administration Aviation and Safety Team. It concluded that OSHA's standards on medical records, record keeping, anti-discrimination, hazard communication, and sanitation should apply to aircraft. The blood-borne pathogen and noise standards could also be applied in a modified form (OSHA, 2001).

On August 7, 2000, a Memorandum of Understanding (MOU) was signed between the Federal Aviation Administration and OSHA. Under the MOU, OSHA will continue to enforce its standards for other aviation industry employees, such as maintenance and ground support personnel (OSHA, 2001). The FAA will issue a proposed new policy statement on application of OSHA regulations to flight attendant safety and health (OSHA, 2001).

The literature currently available related to breast cancer and flight attendants encompasses two major research studies. The European (Finnish) study reported twice the incidence of breast cancer when compared to the general population of Finland (Pukkala et al., 1995). The American study is the largest record linkage study of cancer among Californian flight attendants to date (Reynolds, n.d.). These two studies provide strong evidence that while the overall cancer experience of flight attendants does not differ from that of the general population, they do experience higher rates of certain cancers (Reynolds, n.d.). This observation is consistent with similiar findings in other studies reported in the limited literature on this topic to date. Therefore, more research is needed to determine possible occupational risks among flight attendants for developing breast cancer.

### CHAPTER III

#### METHODOLOGY

The purpose of this study was to determine whether the incidence of breast cancer is different between female flight attendants and women in the U.S. population, and between domestic and international flight attendants. Descriptions of the sample, sampling procedures, instrumentation, treatment of data, and statistical methods are detailed in this chapter.

#### Study Sample

The study sample was composed of domestic and international commercial airline flight attendants living within the United States. The study sample included both domestic flight attendants and international flight attendants. All male flight attendant respondents were excluded from the sample. Female flight attendants who had worked less than five years, were also excluded from the sample.

Approval to conduct the research study was provided by the Human Subjects Review Committee of Texas Woman's University (Appendix A). An invitation to participate in the study was sent by the researcher to the Association of Flight Attendants (AFA) and the Association of Professional Flight Attendants (APFA). Other group participants such as the International Association of Machinists (IAMAW) and the Teamsters Local 2000 were contacted by the researcher on multiple flight attendant websites. One of the associations which initially agreed to participate changed its position

two days after the survey was posted to the association website. The survey was subsequently pulled from the website on the second day of its initial posting. The researcher continued to advertise through other websites such as those of the IAMAW, Teamsters Local 2000, Delta, Northwest, and American Airlines websites. Flight crew listservs such as aircrew.com, DeltaAFA, FlightAttendants.org, and Airline Safety.com that were available and not password protected were also contacted.

The researcher sought to increase the response rate by contacting local flight attendants personally, as well as commercial airline pilots with American and Delta Airlines. University faculty and doctoral students were also contacted who would be flying commercial airlines within the data collection period and who would be willing to distribute the surveys to the flight attendants on their specific flights.

The study sample included both domestic and international flight attendants regardless of the size of the aircraft. Of the total number of completed surveys received, male flight attendants and female flight attendants who had worked less than five years were excluded from the sample.

### Research Instrument

The research instrument used in this study, the Spira Online Flight Attendant Survey (SOFAS), was developed by the researcher based on input and recommendations from a panel of experts familiar with the research topic. This panel was comprised of two flight attendant/attorneys, a flight attendant/pilot, an oncologist, a health educator, a commercial airline pilot, a physician with a specialization in radiology, and an instrument design and development expert. This expert panel assessed the content validity and

readability levels of the online and the printed instruments. The online and printed survey had several revisions to determine the correct flight terminology used and understood by the flight population. Content validity was established through written and verbal communication to the researcher by the panel.

The SOFAS is a two-page online survey or a one-page printed version, composed of 20 questions in a fill-in-the-blank format that took approximately 10 minutes to complete. The instrument is divided into two sections:

In the first section, demographic information (10 questions) is requested, including current age, gender, ethnicity, age of menses, age at first child's birth, whether the respondent had a clinical diagnosis of breast cancer, and whether she has had a mastectomy. Flying data (9 questions) is requested in the second section, including: flight schedule information such as years employed as a flight attendant, full or part-time employment on wide body international aircraft, narrow body international, narrow body domestic, or wide body domestic aircraft; average number of hours flown per month; and the number approximate duration of flight per sequence or leg; approximate altitude of flights; and the number of short segments or long segments usually flown. In addition to these 20 fill-in-the-blank questions, there was an open-ended response section in which participants could provide their comments.

There was poor response to the pilot study, which was conducted internationally.

Although the pilot study had recorded online responses from Australia, Spain, Canada, and Sweden, most responses were from the United States. Because the international

response rate was so low, and since a global standardized incidence rate for breast cancer was not available, it was decided that this study would focus on participants solely from the United States.

### Data Collection

Data collection began on February 15, 2001 and concluded on March 15, 2001. The survey instrument used was the Spira Online Flight Attendant Survey (SOFAS) developed by the researcher in both an online and a printed format (Appendix E). The participants were able to use a variety of venues made available by the researcher to complete the surveys both online and as a printed version. Three options were made available to the participant to complete the survey: (1) an online version, (2) a printed version that was administered by the researcher and could be directly returned to the researcher, or (3) a printed version to be mailed directly to the researcher via a Texas Woman's University post office box. No postage stamps, envelopes, or incentives were provided to the potential respondent by the researcher. Participants had the opportunity to electronically submit questions to the researcher, which were answered by the researcher within two days. Requests to speak with the researcher by telephone were honored within one business week.

### Treatment of the Data

The researcher entered the printed version data into the SOFA survey website. Then the Spira Online Flight Attendant Survey (SOFAS) was downloaded from the website into a delimiter file. This data was then transferred from Excel and the Statistical

Package for the Social Sciences (SPSS, version 10.0) for statistical analysis. Descriptive statistics were used to provide a demographic profile of participants (e.g., age, gender, and race/ethnicity) and responses to selected items. Chi-square statistical analysis was used to determine significant differences between the incidence of breast cancer among domestic and international female flight attendants and between female flight attendants and women in the United States population.



## CHAPTER IV

### FINDINGS

The purpose of the study was to determine whether the incidence of breast cancer is different between female flight attendants and women in the U.S. population, and between domestic and international flight attendants. In this chapter the presentation of findings are provided in both a narrative and a tabular form. Specific findings of the study to be discussed are the descriptive characteristics of the sample presented in frequency tables and the results of the Chi-square analysis of the hypotheses. A summary concludes the chapter.

#### Descriptive Characteristics of the Sample

A total of 535 participants answered the online or printed version of the SOFA survey. Forty-one males (7.7%) and 80 females (15%) with less than five years of experience were excluded before data analysis was begun. Therefore, the following results are applicable only to the female flight attendants who have flown in excess of five years.

The final sample was comprised of 414 female commercial airline flight attendants employed in the United States. The sample was a self-selected convenience sample open to male and female flight attendants between the ages of 25 and 64 years of age who were currently employed with commercial airlines in the United States. The distribution of the survey data, including the personal comments, were included in the

analysis. A profile of the participants was obtained from analysis of the demographic data.

The age distribution was as follows: 8 participants (2%) were in the 25 to 29 age group, 106 participants (26%) were in the 30 to 39 age group, 126 (30%) participants were in the 40 to 49 age group, 166 (40%) were in the 50 to 59 age group, and 8 participants (2%) were in the 60 to 64 age group. Both the domestic flight attendant group and the international flight attendant group were similar in age. The women in the domestic group ranged from 25 to 58 years, with a mean of 42.8 years. The women in the international group ranged from 27 to 64 years with a mean age of 48.2 years.

The ethnic distribution was as follows: 87% Caucasian, 5.8% were African American, 1.7% were Hispanic, 1% were Asian, 2.9% listed Other, and 1.7% did not respond to this item and were coded as Unknown (See Table 1).

Table 1

Ethnicity of the Study Sample

	Frequency	Percent
Caucasian	360	87.0
African American	24	5.8
Hispanic	7	1.7
Asian	4	1.0
Other	12	2.8
Unknown	7	1.7
Totals	414	100

N = 414

The gender of the participants included in the data analysis was female. Males were not denied participation in the survey, but were excluded in the data analysis. Female flight attendants with less than five years flight experience were also excluded in the analysis. This flight experience for exclusion was chosen as a base-set point to better indicate the effects of in-flight radiation relative to flight hours.

The employment history of the participants in the sample is shown in Table 2. Ninety-two or 22.1% of the flight attendants had been employed between 11 and 15.5 years. Eighty-one or 19.4% had been employed 31 to 35 years. Half of the respondents had been flying from 5 to 20 years and the other half between 21 and 42 years.

Table 2

Years of Employment as a Flight Attendant

Number of Years	Frequency	Percent
5.0 – 10.5	62	15.0
11.0 – 15.5	92	22.1
16.0 – 20.0	57	14.0
21.0 – 25.0	45	11.0
26.0 – 30.0	64	15.4
31.0 – 35.0	81	19.4
36.0 – 42.0	13	3.0
Totals	414	100.0

N = 414

Table 3

Distribution of Domestic and International Flight Attendants

Flight Attendant Classification	Frequency	Percent
Domestic	190	45.9
International	224	54.1
Total	414	100.0

N = 414

The approximate duration of the flight attendant segment defined the domestic or international data classification. Domestic female flight attendants numbered 190, or 45.9% of the sample. International flight attendants totaled 224, or 54.1% of the sample.

The number of hours flown ranged from 30 hours per month to 165 hours per month with a mean of 78 hours per month. Based on the demographic profile, the age of the respondents for the onset of menstruation ranged from 9 years to 20 years with a mean of 12.9. Onset of menses is a known reproductive risk factor for breast cancer as well as a familial history. The earlier the onset of menses, the more likely a female will be diagnosed with breast cancer (ACS, 2001). Table 4 depicts the categorical age of the onset of menses. Values not counted are those that were missing from the survey.

Table 4

Age of Onset of Menses

Age in years	Frequency	Percent
9-11	51	12.3
12-14	314	75.8
15-20	45	10.9
Missing	4	1.0

N = 414

Table 5

Age at the Time of Birth of First Child

	<u>n</u>	Minimum	Maximum	<u>x</u>	<u>sd</u>
Variable	219	17.0	47.0	28.9	5.4

Parity

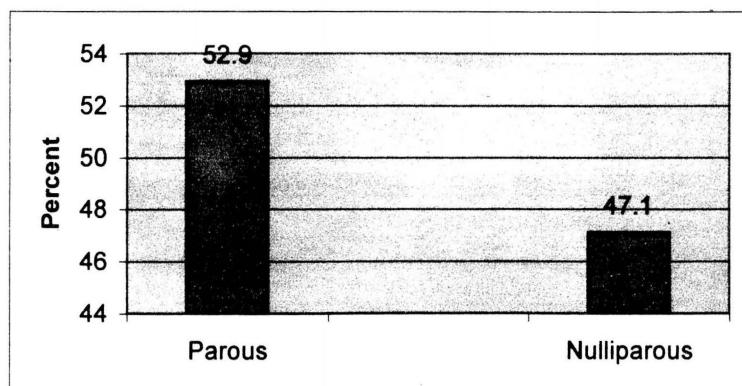


Figure 1

The age of the respondent at the birth of the first child ranged from age 17 to age 47 with a mean age of the first birth at 28.9 years (Table 5). One hundred ninety-five respondents were nulliparous (47.1%). Two hundred nineteen respondents or (52.9 %) had borne children (Figure 1).

#### Flight Attendants with a First Degree Relative Who Had Breast Cancer

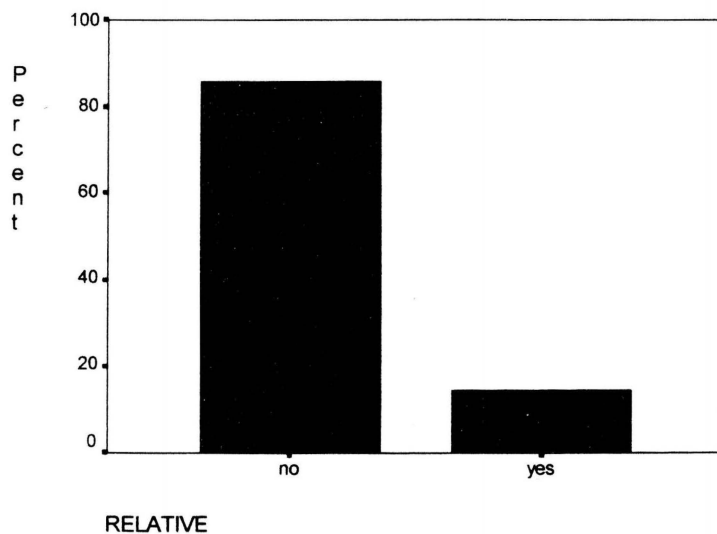


Figure 2

Flight attendants who had a first-degree relative (mother, sister, or daughter) who had been diagnosed with breast cancer totaled 60, or 14.5% of the total sample.

Flight attendants who did not have a first degree relative who had breast cancer totaled 354, or 85.5% of the total sample.

The descriptive characteristics of the breast cancer survivors are shown in Table 6. Thirty-five of the participants from the sample had been clinically diagnosed with breast cancer. Those respondents who had undergone a mastectomy numbered 23 out of the 414 sample of female flight attendants, or 5.5% of the total sample. Those respondents who had undergone a bilateral mastectomy totaled 11, or 2.7% of the total female flight attendant sample. The largest percentage of those clinically diagnosed breast cancer cases described themselves as domestic flight attendants. Although the range of ages reported by the flight attendants surveyed was 31 to 61 years, the majority fell between the ages of 51 and 60. The majority of the breast cancer survivors self-reported as Caucasian (94%). The category of reported onset of menses illustrates that across all three groupings of breast cancer survivors the majority of flight attendants began menses between the ages of 13 and 14 years. There was a high percentage of reported nulliparity across all flight attendant groupings and in both the domestic and international flight attendant divisions.

Table 6

Descriptive Characteristics of the Breast Cancer Survivors

Percentage of the Variables	Breast Cancer Only		Unilateral Mastectomy		Bilateral Mastectomy	
	N=35	Percent	N=23	Percent	N=11	Percent
Age						
31-40 yrs	1	2.9	2	8.6	1	9.1
41-50 yrs	10	28.7	8	34.6	1	9.1
51-60 yrs	23	65.7	13	56.2	9	81.9
61-70 yrs	1	2.9	0	0.0	0	0.0
Ethnicity						
Caucasian	33	94.0	23	100.0	11	100.0
African-American	1	3.0	0	0.0	0	0.0
Other	1	3.0	0	0.0	0	0.0
Menses						
11-12	12	34.3	7	30.4	3	27.3
13-14	20	57.1	15	65.2	8	72.8
15-16	1	2.9	1	4.3	0	0.0
17-18	0	0.0	0	0.0	0	0.0
19-20	1	2.9	0	0.0	0	0.0
Parity						
Nulliparous	21	60.0	14	60.9	6	54.5
Had a Child	14	40.0	9	39.1	5	45.5
Flight Attendant Division						
Domestic	19	54.3	12	52.2	6	54.5
International	16	45.7	11	47.8	5	45.5

N = 35



The number of years employed on commercial aircraft, hours flown per month, average altitudes flown, and specific flight attendant divisions are shown in Table 7. All breast cancer cases had been employed a minimum of 12 years with a commercial airline. Of the flight attendants that reported having had a bilateral mastectomy, 63.7% had been employed with a commercial airline from 32 to 41 years. Across all three breast cancer survivor groups, the majority of flight attendants report flying 71 to 90 hours per month. Across all three groups, domestic flight attendants reported a slightly higher incidence of breast cancer, unilateral mastectomies, and bilateral mastectomies than international flight attendants.

Table 7

Flight Experience of Breast Cancer Survivors

Percentage of the Variables	Breast Cancer Only		Unilateral Mastectomy		Bilateral Mastectomy	
	N=35	Percent	N=23	Percent	N=11	Percent
Years Employed						
12-21 yrs	12	34.4	11	47.7	3	27.3
22-31 yrs	10	28.8	3	12.9	1	9.1
32-41 yrs	13	37.3	9	38.9	7	63.7
Hours Flown Per Month						
30-50	1	2.9	0	0.0	0	0.0
51-70	5	14.4	4	17.3	2	18.2
71-90	24	68.7	16	69.4	8	72.8
91-110	5	14.4	3	12.9	1	9.1
Altitude Flown						
25-30,000 feet	8	22.9	7	30.4	5	45.5
31-36,000 feet	15	43.0	7	30.3	4	36.4
37-42,000 feet	11	31.6	9	38.9	1	9.1
Missing	1	2.9			1	9.1
Flight Attendant Division						
Domestic	19	54.3	12	52.2	6	54.5
International	16	45.7	11	47.8	5	45.5

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N = 35

Note. These participants reported flying at a mean altitude of 34,629 feet, indicating the lowest altitude flown was 19,000 feet and the highest altitude was 42,000 feet.

## Statistical Analysis of the Data

The data were analyzed using the Statistical Package for the Social Sciences software (SPSS 10.0, version 1999). SPSS Crosstabs, and a Chi-square test was performed on the data. Descriptive statistics were used to further analyze the data. Results of the data analyses were examined in regard to each of the null hypotheses. Statistical significance was determined at the  $p = .05$  level of significance. Presentation of the findings for each hypothesis includes a restatement of the hypothesis, the statistical procedure used, and a brief description of the findings.

### Null Hypothesis 1

There is no significant difference in the incidence of breast cancer between female flight attendants and women in the U.S. population.

In order to perform a test of statistical significance of the differences between these two groups, comparative data from a sample of women in the U.S. population would be required. Since such data were not obtained for this study, this null hypothesis was not analyzed.

### Null Hypothesis 2

There is no statistically significant difference in the incidence of breast cancer between domestic and international female flight attendants.

The variables examined here, type of flight attendant and diagnosis of breast cancer, were found to be independent of each other; therefore, there is no significant difference in the diagnosis of breast cancer within the domestic and international flight

attendant population groups. The Pearson chi-square test showed a chi-square of 1.084 and a p-value of .298, which was greater than .05.

Table 8

Comparisons of the Diagnoses of Breast Cancer for Domestic and International Flight Attendants

Type of Flight Attendant		Cancer		Total
		Not Diagnosed	Diagnosed	
Domestic	Count	171.0	19.0	190.0
	Expected Count	173.9	16.1	190.0
International	Count	208.0	16.0	224.0
	Expected Count	205.1	18.9	224.0
Total	Count	379.0	35.0	414.0
	Expected Count	379.0	35.0	414.0

$$\chi^2(1, N = 414) = 1.084, p = .298$$

Null Hypothesis 3

There is no significant difference in the incidence of breast cancer between international female flight attendants and women in the U.S. population.

In order to perform a test of statistical significance of the differences between these two groups, comparative data from a sample of women in the U.S. population would be required. Since such data were not obtained for this study, this null hypothesis was not analyzed.

#### Null Hypothesis 4

There is no significant difference in the incidence of breast cancer between domestic female flight attendants and women in the U.S. population.

In order to perform a test of statistical significance of the differences between these two groups, comparative data from a sample of women in the U.S. population would be required. Since such data were not obtained for this study, this null hypothesis was not analyzed.

The descriptive characteristics of the study sample self-reported at the time of completing the survey indicated they were mostly female domestic flight attendants and had flying experience ranging between 5 and 42 years. A clinical diagnosis of breast cancer was reported by 8.5% of the sample, with 5.6% of the sample reporting a unilateral mastectomy versus 2.7% reporting a bilateral mastectomy.

The results of the study are summarized in the following statements:

1. There was a not a statistically significant difference between the incidence of breast cancer between domestic and international flight attendants.
2. Since data was not obtained to test the null hypotheses for 1, 3, and 4, which involved comparisons to women in the U.S. population, these were not analyzed.

## CHAPTER V

### SUMMARY, DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

The final chapter is presented in four parts. The first part, the summary, presents an overview of the study, including the purpose for the study, description of the participants, methods of data collection, and treatment of the data. The second part provides a discussion of the findings. In part three, the conclusions to be drawn from the study are presented. In the last part of this chapter, recommendations for further research and a discussion of the implications for health education are provided.

#### Summary

The purpose of the study was to determine whether the incidence of breast cancer was different between domestic and international flight attendants in the United States and between female flight attendants and women in the U.S. population. The research instrument used was the Spira Online Flight Attendant Survey (SOFAS). The 20-question SOFAS instrument, in either an online or a printed-version was available to all female flight attendants employed a minimum of five years with a commercial airline.

The study used a convenience sample population of 535 flight attendants. Of the 535 male and female flight attendants who responded to the survey, 414 female flight attendants met the gender and minimum years of employment for the final sample. Each participant completed the SOFAS questionnaire demographic section comprised of (a) age, (b) gender, (c) ethnicity, (d) age of menarche, (e) age at first child's birth,

(f) diagnosis of breast cancer, (g) unilateral mastectomy, (h) bilateral mastectomy, and (i) a first degree relative (mother, sister, or daughter) diagnosed with breast cancer.

Participants also completed the flight schedule information listed as (a) years employed as a flight attendant, (b) wide body domestic or international aircraft, (c) narrow body domestic or international aircraft, (d) average flight hours per month, (e) approximate duration of flights (hours/leg), (f) approximate altitude of flights, (g) identification of short or long segments, and (h) city or country of base residence.

Although a number of studies have been conducted on flight attendants and in-flight radiation, no attention has specifically been given to the possible contributing factors related to altitude, duration, and work years that differ between domestic and international flight attendants. It is important that the airline industry as a whole, airline employee associations, and each individual employee, in particular, be aware of how those factors might affect the health of flight attendants, both domestic and international. By becoming more aware and informed, the airline industry, associations, and employees should be able to address concerns of the flight personnel and advocate continued research and health education.

Research pertaining to in-flight crew members and corresponding published and unpublished studies has primarily focused on large record linkage studies done in Finland and in California (Pukkala et al. & Reynolds et al.). After an extensive literature search, no research was found regarding a direct link between ionizing radiation exposures and breast cancer.

Data was entered by the researcher into the SOFA survey website. The Spira Online Flight Attendant Survey (SOFAS) was downloaded from the website into a delimiter file which was transferred from Excel and the Statistical package for the Social Sciences (SPSS, version 10.0) for statistical analysis. Descriptive statistics were used to provide a demographic profile of participants (e.g., age, gender, and race/ethnicity) and responses to selected items. Chi-square statistical analysis was used to determine significant differences between the incidence of breast cancer among domestic and international female flight attendants and between female flight attendants and women in the United States population.

### Discussion of the Findings

During the initial phase of data collection, the researcher anticipated that perhaps only flight attendants who had experienced breast cancer or surgical removal of one or both breasts would respond to the SOFAS questionnaire. However, the final data set indicated that the majority of the women who responded to the survey were women who had never experienced breast cancer or had a unilateral or bilateral mastectomy. The numbers who self-reported as breast cancer survivors were actually much smaller than would have been expected in the U.S. general population of women. Hence, the self-selection as a confounding factor does not appear to skew the final results.

Relative to the demographic survey questions, both the domestic and international flight attendant groups were identical in gender, and predominantly Caucasian. Domestic flight attendants were defined as cabin crewmembers flying less than a 6-hour non-stop flights, while international flight attendants were defined as those flying between nations



(internationally) and for durations of longer than 6 hours non-stop. Both groups were similar with regard to onset of menses with the largest group being the 12-14 year old age group. The earlier the onset of menses, the more likely a female will be diagnosed with breast cancer (ACS, 2001).

An unexpected result of the parity survey question was the high percentage (47.1%) of nulliparous participants among the domestic and international flight attendants. While these results suggest that flight attendants may experience a higher percentage of nulliparity than people of the same ages in the general population, this study cannot provide information on why that may be so. Nulliparity, or not having borne any children, is a recognized risk factor for breast cancer (ACS, 2001).

Self-reported average altitudes flown were similar between the two groups of flight attendants. The flight related responses were similar between the two groups, with a reported mean of 34,629 feet. Additionally, similar cumulative hours were worked monthly, with a reported mean of 78 hours per month. Flight duration varied according to the classification of the flight attendant as either domestic (45.9%) or international (54.1%). The United States breast cancer incidence according to the American Cancer Society (2001) is 12.5%. The breast cancer incidence within this domestic and international female flight attendant population was 8.5% (Table 1).

For all ages combined, white women are more likely to develop breast cancer than any other ethnic group, 113.2 cases per 100,000 population (ACS, 2001). Seventy-seven percent of all new cases of breast cancer and 84% of breast cancer deaths occurred in women 50 years of age and older (ACS, 2001).

The incidence of breast cancer among women in the U.S. is 12.5%. The breast cancer incidence among domestic flight attendants in the sample was 10%. These findings are inconsistent with the earlier research done in other countries such as Finland and the Pukkala et al study that indicated that the incidence of breast cancer among Finnish flight attendants was significantly greater than the incidence of breast cancer among Finnish women in the general population.

There was not a significant difference in the incidence of breast cancer in the female flight attendant population when compared to the women in the United States general population. All reported breast cancer cases were observed in respondents 40 years of age or older. The small sample size and the researcher-imposed data collection methods influenced the generalizability of these study results. Similar studies and less restrictive data collection methods need to be implemented using larger, more representative samples.

### Conclusions

Based on the findings from this study, the following conclusions can be drawn regarding the null hypotheses used for this research.

Null Hypothesis 1. There is no significant difference in the incidence of breast cancer between female flight attendants and women in the U.S. population. This null hypothesis is NOT REJECTED.

Null Hypothesis 2. There is no statistically significant difference in the incidence of breast cancer between international and domestic female flight attendants. This null hypothesis is NOT REJECTED.

Null Hypothesis 3. There is no significant difference in the incidence of breast cancer between international female flight attendants and the U.S. population. This null hypothesis is NOT REJECTED.

Null Hypothesis 4. There is no significant difference in the incidence of breast cancer between domestic female flight attendants and the U.S. population. This null hypothesis is NOT REJECTED.

### Recommendations

Based on the results of this study, the following recommendations are presented for further research:

1. Replicate the study within the flight attendant professional associations, using similar samples, in order to observe for patterns of differences or similarities among the domestic and international flight attendant groups.
2. Replicate the study using a different procedure (i.e., expanded survey question base including more flight history information) for administering and collecting data to further define a possible link between breast cancer and female flight attendants.
3. Replicate the study and include a true control group (i.e., night nurses) to determine similarities or differences between the two sample groups.
4. Replicate the study to obtain a larger sample size to permit more identifiable differences between the domestic and international flight attendants.
5. Conduct a longitudinal study, using similar samples and methods, to begin a tracking and documentation measurement system of flight attendant health records.

6. Conduct research to determine the most effective message pathways to reach this geographically diverse population.

7. Use two random populations with a greater difference in the altitude flown and the number of hours flown. This might clarify the relationship of the variable flight altitude as a factor in breast cancer in female flight attendants.

8. Conduct follow up studies related to the reported increase in thyroid cancers among female flight attendants on turbopropeller aircraft (V. Stogner, personal communication, March 27, 2001).

9. Conduct research to determine the most effective strategies for increasing flight attendant participation in health research studies.

#### Implications for Health Education

This group of women, a subgroup of the women at risk for developing breast cancer due to occupational hazards (i.e., exposure to low dose ionizing radiation), has not been globally recognized as a special population that requires further study to determine possible occupational risks for developing breast cancer. Health educators could contribute to the understanding of the breast health care needs of this special population of women in the following ways:

1. Theory testing or evaluation of this group prior to developing interventions for promoting early detection behaviors may help to determine why the sample does not respond in larger numbers to health-related surveys.

2. The health educator may conduct assessments to determine the health

needs of flight attendants and the best design strategies and developments for behavior change in an effort to respond to the health needs of the flight attendant population.

3. The health educator may attempt to identify industry and association educational pathways to pursue health education teaching opportunities.

4. The health educator can be a liaison between the airline industry and the flight attendant associations to promote better employee health practices.

5. The health educator can work within the existing airline industry and/or flight attendant association organizations to empower flight attendants to realize that they do, indeed, have control over their own health and the ability to seek out health education opportunities available to them.

6. Develop health education strategies to impact early detection and prevention of breast cancer.

7. Conduct health focus groups of flight attendants from varying commercial airlines to access information related to increasing flight attendant participation in future health education programs.

Clearly, there is a role for the health education profession to respond to the breast health care needs of all flight attendants based on survey comments that indicate that both domestic and international flight attendants also report that this is an area that needs to be investigated. Designing, implementing, and evaluating appropriate health education programs that respond to the needs of this population are long overdue.

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[Illegible text]

## APPENDIX A

### Human Subjects Review Committee Approval

TEXAS WOMAN'S  
UNIVERSITY

DENTON, DALLAS, HOUSTON

HUMAN SUBJECTS  
REVIEW COMMITTEE  
P.O. Box 425619  
Denton, TX 76204-5619  
Phone: 940/895-3377  
Fax: 940/895-3416

November 15, 2000

Ms. Judy Spira  
12538 Chisum Road  
Sanger, TX 76266

Dear Ms. Spira:

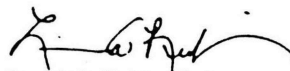
*Re: The Incidence of Breast Cancer among Domestic and International Flight Attendants*

The above referenced study has been reviewed by a committee of the Institutional Review Board (IRB) and was determined to be exempt from further TWU IRB review.

If applicable, agency approval letters obtained should be submitted to the IRB upon receipt prior to any data collection at that agency. Because you do not utilize a signed consent form for your study, the filing of signatures of subjects with the IRB is not required.

Another review by the IRB is required if your project changes. If you have any questions, please feel free to call the Institutional Review Board at the phone number listed above.

Sincerely,



Dr. Linda Rubin, Chair  
Institutional Review Board - Denton

cc. Dr. Susan Ward, Department of Health Studies  
Dr. Mary Shaw, Department of Health Studies  
Graduate School

## **APPENDIX B**

### **Graduate School Permission**



TEXAS WOMAN'S  
UNIVERSITY

**1901 - 2001 CENTENNIAL**

The Graduate School  
P.O. Box 425649, Denton, TX 76204-5649  
T 940-898-3400 F 940-898-3412

February 22, 2001

Ms. Judy B. Spira  
12538 Chisum Road  
Sanger, TX 76266

Dear Ms. Spira:

I have received and approved the prospectus entitled "**The Incidence of Breast Cancer among Domestic and International Flight Attendants**" for your *dissertation* research project.

Best wishes to you in the research and writing of your project.

Sincerely yours,

Michael H. Droge  
Dean of Graduate Studies and Research

MHD/sjr

cc Dr. Mary Shaw, Health Studies  
Dr. Susan Ward, Health Studies

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**APPENDIX C**  
**SOFAS Printed Survey**



## Flight Attendant Health Survey

FAX BACK: 1 - 940 458 3915

The return of your completed questionnaire constitutes your informed consent to act as a participant in this research.

You are being asked to participate in a research study for Ms. Judy Spira's doctoral dissertation at Texas Woman's University. The purpose of this research is to assess and compare the incidence of breast cancer among domestic and international flight attendants on commercial carriers. Those of you visiting this website may elect to participate in the SOFAS (Spira Online Flight Attendant Survey). The questionnaire will take approximately 10 minutes to complete.

Your participation in this research study is entirely voluntary. To maintain confidentiality and anonymity, your name is not required. You may also use an alternate or "neutral" computer to further enhance user-anonymity. Any identifiable information will be removed by the researcher. You may choose to print the "online survey" and mail it or fax it to the researcher, or submit the survey online. The "newsletter survey" may be either mailed to the university address below or faxed directly to the researcher. If at any time, you are uncomfortable with answering a specific question, you are not required to answer it. You may also elect to read the survey and decline to complete it in its entirety.

If you have any questions about the research study, please ask the researcher directly.

I want to take this opportunity to thank you in advance for participating in this research. A summary of the results will be mailed to the Director of this website/newsletter.

1. My current age is: \_\_\_\_\_
2. Gender: \_\_\_\_\_
3. Race: \_\_\_\_\_
4. My age at start of menstruation was: \_\_\_\_\_ years  
(NA if not applicable)
5. My age at my first child's birth was: \_\_\_\_\_ years  
(NA if not applicable)
6. I have been clinically diagnosed with breast cancer: ☐ Yes ☐ No
7. I have had a mastectomy: ☐ Yes ☐ No  
Bilateral: ☐ Yes ☐ No
8. I have a first degree relative (mother, sister, or daughter)  
diagnosed with breast cancer: ☐ Yes ☐ No

---

### "My Flight Schedule"

---

1. I have been employed as a Flight Attendant (FA): \_\_\_\_\_ years
- 2.a. I have flown Full-time / Part-time  
wide body international (in years / NA if not applicable): \_\_\_\_\_ years ☐ Full-time ☐ Part-time
- b. I have flown Full-time / Part-time  
narrow body international (in years / NA if not applicable): \_\_\_\_\_ years ☐ Full-time ☐ Part-time
- c. I have flown Full-time / Part-time  
wide body domestic (in years / NA if not applicable): \_\_\_\_\_ years ☐ Full-time ☐ Part-time
- d. I have flown Full-time / Part-time  
narrow body domestic (in years / NA if not applicable): \_\_\_\_\_ years ☐ Full-time ☐ Part-time
3. I fly an "average" of \_\_\_\_\_ hours per month.
4. The approximate "duration" of my flight segments are: \_\_\_\_\_ hours/leg
5. The approximate "altitude" of my normal flights are at: \_\_\_\_\_ feet  
(example: 30,000 feet, 41,000 feet)
6. I usually fly short segments (less than 1.5 hours): ☐ Yes ☐ No
7. I usually fly long segments (more than 3 hours): ☐ Yes ☐ No
8. I am based in (city / country): \_\_\_\_\_

#### Comments:

please enter any comments/questions...

**APPENDIX D**  
**Spira Online Flight Attendant Survey**  
**(SOFAS)**



Your participation in this research study is entirely voluntary. To maintain confidentiality and anonymity, your name is not required. You may also use an alternate or "neutral" computer to further enhance user-anonymity. Any identifiable information will be removed by the researcher. You may choose to print the "online survey" and mail it or fax it to the researcher, or submit the survey online. The "newsletter survey" may be either mailed to the university address below or faxed directly to the researcher. If at any time, you are uncomfortable with answering a specific question, you are not required to answer it. You may also elect to read the survey and decline to complete it in its entirety.

I want to take this opportunity to thank you in advance for participating in this research. A summary of the results will be mailed to the Director of this website/newsletter.

I have a first degree relative  
(mother, sister or daughter)  
diagnosed with breast cancer: ☐ Yes  
☐ No

## My Flight Schedule



I have been employed as a Flight Attendant (FA - in years): \_\_\_\_\_

I have flown Full-time / Part-time  
wide body international (in years / NA if not applicable): ☐ Full time ☐ Part time

I have flown Full-time / Part-time  
narrow body international (in years / NA if not applicable): ☐ Full time ☐ Part time

I have flown Full-time / Part-time  
wide body domestic (in years / NA if not applicable): ☐ Full time ☐ Part time

I have flown Full-time / Part-time  
narrow body domestic (in years / NA if not applicable): ☐ Full time ☐ Part time

I fly an "average" of - hours per month: \_\_\_\_\_

The approximate "duration" of my flights are (hours/leg): \_\_\_\_\_

The approximate altitude of my normal flights (in feet, e.g. 30,000): \_\_\_\_\_

I usually fly short segments (less than 1.5 hours): ☐ Yes ☐ No

I usually fly long segments (more than 3 hours): ☐ Yes ☐ No

Remarks: \_\_\_\_\_

Submit survey | Reset

Fax-back → [Download SQFAS survey \(in pdf, 75kb\)](#) • (Adobe Acrobat Reader 4.05 is required)

**Thank you for your cooperation.**  
**Texas Woman's University P.O. Box 425677 Denton, TX 76204-5677**  
**Fax: 940-458-3915 Email:**

**APPENDIX E**  
**Institution Responses**



TEXAS WOMAN'S  
UNIVERSITY

**1901 - 2001 CENTENNIAL**

Department of Health Studies  
College of Health Sciences  
P.O. Box 425499, Denton, TX 76204-5499  
T 940-898-2860 F 940-898-2859

February 24, 2001

To: Ginny Stogner, Recording Sec'y  
From: Judy Spira, RN PhD candidate  
Re: Attached Human Subjects Review Approval  
And Proposal (Accepted)

Dear Ginny,

I am faxing these Saturday night from home and can be reached at my home number for the first part of the week: 940-458-7208 and fax at 940-458-3915. My mailing address is 12538 Chisum Road, Sanger, TX 76266.

Thanks for all the help.

  
Judy

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Danny G. Campbell, President • Anne Meyer, Vice President • Robert T. Krabbe, Secretary Treasurer • Shelley Worley, Recording Secretary  
Lynn Kokal, Trustee • Dennis McCarthy, Trustee • Andrew Collis, Trustee

February 13, 2001

Judy Spira  
Texas Woman's University  
P.O. Box 425677  
Denton, TX 76204-5677

Dear Judy,

Here's a copy of our latest newsletter, with your survey on page 13. I think it turned out pretty well.

I hope you get some good responses from this for your research.

Please let me know if you're doing any additional research concerning Flight Attendants, and if there is anything we can do to help promote it.

Sorry that I didn't send this out to you last week but I got a little behind.

Thanks again for allowing us to use your survey.

Take care,

A handwritten signature in black ink, appearing to read "Dennis McCarthy". The signature is fluid and cursive, with the last name being particularly prominent.

Dennis McCarthy  
Trustee  
Teamsters Local Union 2000

Doc:com/sgood/12  
Rch/1/1/1/1/1  
upm.02.13.01

2850 Metro Drive • Suite 225 • Bloomington, MN 55425 • (952) 854-2738 • (800) 428-6772 • FAX (952) 854-3165

Affiliated With The International Brotherhood of Teamsters Airline Division AFL-CIO

All locations where Northwest Flight Attendants and Flight Attendants employed by any Northwest Affiliated Commuter Airlines are based



TEXAS WOMAN'S  
UNIVERSITY

**1901 - 2001 CENTENNIAL**

Department of Health Studies  
College of Health Sciences  
P.O. Box 425499, Denton, TX 76204-5499  
T 940-898-2860 F 940-898-2859

December 19, 2000

To: President John Ward  
Ph 817-540-0108  
817-540-2077

From: Judy Spira, RN PhD candidate  
Texas Woman's University

Dear President John Ward,

I am submitting to you the address for the "5 minute FA Health Survey" located at <http://home.flash.net/~jcspira/sofas.html>. I hope that you can help me increase the Currently "seasonal" slow response rate. I understand you are very busy at this time.

Thank you so very much.

Judy Spira, RN PhD candidate  
Health Studies Department  
Texas Woman's University  
Denton, Texas  
USA

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TEXAS WOMAN'S  
UNIVERSITY

**1901 - 2001 CENTENNIAL**

Department of Health Studies  
College of Health Sciences  
P.O. Box 425499, Denton, TX 76204-5499  
T 940-898-2860 F 940-898-2859

Mr. Gary Thompson  
Supervisor  
Inflight Training  
Atlanta, GA

Dear Gary,

I have just met with Jim Fitzgerald about my research surveys. I believe he needs a phone call from you to firm things up regarding this research. I hope you got my fax of February 6, 2001 along with a copy of the one page research survey.

Please feel free to call me at home 940-458-7208 or his home at 817-488-5016. He is getting ready to go out on a trip in 2 days.

Let me know if I can do anything else to increase the response rates.

Thank you again,

Judy Spira RN PhD candidate  
Texas Woman's University  
Health Sciences  
Denton, TX  
USA

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## APPENDIX F

### Proposals to Increase Response Rates

FOLLOW-UP LETTER & APPROVAL BY DEPARTMENT CHAIR

November 6, 2000  
Jeff Zack  
Association of Flight Attendants  
Director of Communications  
1275 'K' Street NW  
Suite 500  
Washington, D.C. 20005  
(202) 712-9799

Re: Dissertation Research Title: The incidence of breast cancer among domestic and international flight attendants.

Dear Department Chair,

Thank you for your time discussing my dissertation research request. I am requesting your approval for the online survey participation of currently employed flight attendants in this doctoral research study.

Flight attendants represent a significant part of the inflight crew and understanding their health needs is important to the crewmembers as a group, as well as individually. As we discussed, the purpose of this study is to assess the incidence of breast cancer among domestic and international flight attendants.

I realize that time is a precious commodity, so I have carefully chosen the first week of December through the last week of December to collect data (when participants' schedules may allow for more flexibility due to vacation holidays). The survey will be presented December 1, 2000 on the Association of Flight Attendants (AFA) webpage with a link to my email address at [jbspira@flash.net](mailto:jbspira@flash.net). The survey should be completed in approximately 10 minutes and submitted to this email address.

The survey will be voluntary and is specifically for part-time and full-time commercial flight attendants. Flight attendants from other professional organizations are also welcome to participate. In addition, confidentiality and anonymity will be maintained during the course of the study for the participant.

After March 1, 2001, I will provide you with a summary document for your review upon request. I look forward to the department's participation.

I will be available by phone or email to discuss any question you might have. I will call you in 10 days to follow up. My phone number is 940-458-7208 and my email address is [jbspira@flash.net](mailto:jbspira@flash.net).

Respectfully yours,

Judy B. Spira

Approval to Participate in Research Study  
Department Chair \_\_\_\_\_ Institution \_\_\_\_\_ Date \_\_\_\_\_



Re: [Fwd: Health]

**Subject: Re: [Fwd: Health]**

**Date:** Mon, 6 Nov 2000 17:44:04 EST

**From:** CAPTGIBBS@aol.com

**To:** jbspira@flash.net

Judy:

APFA has been very busy because of negotiations...John has been in Chicago with out team and the mediator assigned to our case...I have written two articles for our union newsletter on breast cancer...if you wish to put your survey in our newsletter then you need to send it to me and I will include it in an article and also ask the newsletter editor to make it a tear out page so the member could complete it and return to an address at the university that you designate...I think the newsletter would be better than the website (more flight attendants...send the survey and some background in an attachment in wordperfect 8.0 and I'll deal with the article and survey.  
Patt Gibbs

Re: Yes. lets meet in Seattle!!!

**Subject: Re: Yes. lets meet in Seattle!!!**

**Date:** Thu, 22 Mar 2001 21:11:04 -0800 (PST)

**From:** elaine darling <ejdarling@yahoo.com>

**To:** Judy Spira <jbspira@flash.net>

--Judy, I have those days off as I start teaching this spring quarter. Lets meet for lunch downtown in Seattle. Pick a date and I will be there. Have so much to tell you. And it is good news. Am VERY busy!! Elaine PS Will be working with Univ. of So. Carolina medical School. Dr. Joyce Nichols-she will contact you because she wants to know what you are doing. And she wants to help us with our research study on the flight attendants!!

---

Do You Yahoo!?

Get email at your own domain with Yahoo! Mail.

<http://personal.mail.yahoo.com/>

surveys from flight attendants

**Subject: surveys from flight attendants**  
**Date: Wed, 20 Dec 2000 21:39:13 EST**  
**From: PBIHOMES@aol.com**  
**To: jbspira@flash.net**

you probably only got a small response from flight attendants because people are tired of seeing their tax dollars blown away on wacko funding projects that do not accomplish anything except provide welfare for people doing research.

Fwd: Breast Cancer Research

**Subject: Fwd: Breast Cancer Research**  
**Date: Wed, 22 Nov 2000 19:53:25 EST**  
**From: Mlsiminger@aol.com**  
**To: jbspira@flash.net**

---

**Subject: Breast Cancer Research**  
**Date: Sat, 18 Nov 2000 15:15:43 -0800**  
**From: prinet@speakeasy.org**  
**To: subscribers@lists.blueturtle.net**

Dear Fellow Flight Attendants,

While we wait for the final results. I have just received this email.

Please take the time to fill out the survey in the website listed below the message.

Sincerely,  
Jose Arturo Ibarra  
###

Judy Spira is a doctoral candidate at Texas Women's University. As part of her dissertation, Judy is researching the incidence of breast cancer in the flight attendant work force. Please feel free to circulate this survey to anyone who might want to add their own information to this growing database.

<http://home.flash.net/~jcspira/sofas.html>

Re: fwd

**Subject: Re: fwd**  
**Date: Wed, 22 Nov 2000 14:32:19 EST**  
**From: Mlsiminger@aol.com**  
**To: jbspira@flash.net**

Hi Judy

I read the information on the Teamsters fa union board. I will definitely inform my co-workers of the survey. If I can be of any help please let me know.

Marty

**Subject:**

**Date:** Wed, 29 Nov 100 14:26:39 Australia/NSW

**From:** wesley@one.net.au

**To:** jbspira@flash.net

Judy, I am the editor of EX-SYD, the FAAA newspaper in Australia. I could not find your web address on the net. Is <http://home.flash.net/~jcspira/sofas.html> correct? This edition goes to print on Tuesday and I would like to have everything correct. I myself would like a copy (sorry I am male), however I am doing my third year in psychology and this is interesting.  
Regards Wesley Jones

-----  
This message was sent using One.Net's Mail Man.  
<http://mailman.one.net.au>

Re: To Steve Wilhite

**Subject: Re: To Steve Wilhite**  
**Date:** Wed, 29 Nov 2000 00:04:40 -0500  
**From:** Steve Wilhite <webmaster@deltaafa.org>  
**To:** Judy Spira <jbspira@flash.net>

Judy,

I have included a blurb on your research project in our "Today's Update" section <<http://www.today.html>> for tomorrow morning, and included a link to your survey page. In addition, i have added a link to your survey page to our permanent "Safety" page, <<http://www.deltaafa.org/safety.html>>.

Please copy your results to me; our flight attendant readers will be most interested.

Best wishes,  
Steve

>I just received a message from Linda Sorenson that you might want to  
>post my doctoral research survey on your site. This is my PhD survey  
>entitled: "The incidence of breast cancer among domestic and  
>international flight attendants" you are free to post it to your  
>site...it is open to all FA's who are interested..I have sent it to AFA  
>and APFA.  
>  
>The address is <http://home.flash.net/~jcspira/sofas.html>----  
>this site will remain open only for the next 4 weeks. At that time I  
>will conclude data retrieval and begin data analysis. I will send you a  
>copy of the results upon request.  
>  
>Thank you.  
>  
>Judy Spira  
>PhD candidate  
>Texas Womans' University

Steve Wilhite  
Web Consultant  
Delta Flight Attendant/AFA  
<http://www.deltaafa.org>  
webmaster@deltaafa.org

Hi Judy

**Subject: Hi Judy**

**Date:** Fri, 22 Dec 2000 15:30:27 -0500

**From:** HELD-SZLASA CINDY L <steveandcindy@compuserve.com>

**To:** Judy <jbspira@flash.net>

Sorry to hear the turnout for the survey was so low. I find that interesting because this group is very vocal about health issues. I think alot of the fa's are deleting their mail because they were so inendated with mail before we signed the contract and they just want a break. I would post it again. I am wondering if you are using USAir also. I have a contact their if you are not and will give you her mail address. They have some 10,000 stews. Another name is on the bulletin board this week with breast cancer. Anyway keep up the good work and thank you.....cindy held-szlasa



RE: Can you download????

**Subject:** RE: Can you download????  
**Date:** Sun, 11 Feb 2001 16:54:30 +0100  
**From:** "STAVLA" <stavla@stavla.org>  
**To:** "Judy Spira" <jbspira@flash.net>

Dear Judy:

We are about to start the new issue of our magazine "AL VUELO" and we would like to write about breast cancer on flight attendants, one of our colleagues workinf for the union had one breast removed 15 days ago due to cancer at the same time she had a plastic operation, Could you guide us a bit on how to focus this matter.

Un saludo  
ARTURO ROSA GUARDIOLA  
STAVLA

El ordenador desde el que se ha enviado este correo está protegido por antivirus Mcafee y su actualización es del 9.2.2001

-----Mensaje original-----  
De: Judy Spira [mailto:jbspira@flash.net]  
Enviado el: sábado, 20 de enero de 2001 22:53  
Para: STAVLA  
Asunto: Re: Can you download????

Have received a few more surveys...thanks to you....will close down Feb 15, 2001. I cannot thank you enough for all your help and good will across the ocean!!!

judy

STAVLA wrote:

> Dear Jury:  
>  
> Happy New Year.  
>  
> I can try enclosing the survey in when we send our magazine but this will  
> not happen before two months. I also must tell you that anytime we have  
> sent  
> any form to fill and for the flight attendants to mail back, response has  
> been poor. We even sent paid mail envelopes, poor reply.  
>  
> Try also at this web [www.crewstart.com](http://www.crewstart.com)  
> Here you will find lots of links to flight attendants unions, most from  
> USA  
> and Europe. Let me know if it works.  
>  
> Un saludo  
> ARTURO ROSA GUARDIOLA  
> STAVLA  
>  
> El ordenador desde el que se ha enviado este correo está protegido por  
> Mcafee y su actualización es del 27.12.2000  
>  
> -----Mensaje original-----

RE: Can you download????

**Subject: RE: Can you download????**  
**Date:** Mon, 8 Jan 2001 20:37:50 +0100  
**From:** "STAVLA" <stavla@stavla.org>  
**To:** "Judy Spira" <jbspira@flash.net>

Dear Jury:

Happy New Year.

I can try enclosing the survey in when we send our magazine but this will not happen before two months. I also must tell you that anytime we have sent any form to fill and for the flight attendants to mail back, response has been poor. We even sent paid mail envelopes, poor reply.

Try also at this web [www.crewstart.com](http://www.crewstart.com)  
Here you will find lots of links to flight attendants unions, most from USA and Europe. Let me know if it works.

Un saludo  
ARTURO ROSA GUARDIOLA  
STAVLA

El ordenador desde el que se ha enviado este correo está protegido por McAfee y su actualización es del 27.12.2000

-----Mensaje original-----

De: Judy Spira [<mailto:jbspira@flash.net>]  
Enviado el: lunes, 08 de enero de 2001 20:24  
Para: STAVLA  
Asunto: Re: Can you download????

Dear Arturo..

Here is an update of the research project....I have received 123 surveys to this date. I feel this is still very low...but I must thank you because I have received the most from all of YOUR wonderful efforts!!!

In the comments section of the online survey many of the flight attendants are telling me that a large segment of FAs do NOT have computers or use them on a regular basis. This may be why I am missing so many of the FAs. Perhaps if it were posted in an FA lounge or printed entirely in a professional newsletter?  
(It could be mailed all at once to me in a packet from the FA site)?

Please tell me what you think, Arturo, I am open to all ideas and possibilities.

Thanks so very much,

judy

STAVLA wrote:

> Dear Judy:  
>

RE: Can you download????

**Subject: RE: Can you download????**  
**Date:** Mon, 18 Dec 2000 20:02:11 +0100  
**From:** "STAVLA" <stavla@stavla.org>  
**To:** "Judy Spira" <jbspira@flash.net>

Dear Judy:

I have sent a massive e-mail wiht the survey link page. Let me know if it wors.

Merry Xmas to you and the ones near you

ARTURO ROSA GUARDIOLA  
STAVLA

-----Mensaje original-----  
De: Judy Spira [mailto:jbspira@flash.net]  
Enviado el: lunes, 18 de diciembre de 2000 19:22  
Para: STAVLA  
Asunto: Re: Can you download????

Update for you....I still have such a slow response to date. Can you recommend a better method to obtain more responses to this health survey? I will extend the data time for another month and then I must close it down. Thank you for any ideas.

Judy Spira RN PhD candidate  
Texas Womans' University  
Texas, USA

STAVLA wrote:

> Yes it is working right.  
>  
> We have sent it to several female flight attendants. will you be so kind as  
> to send us your report on this subject?  
>  
> thanks  
> ARTURO ROSA GUARDIOLA  
> STAVLA  
> SPANISH FLIGHT ATTENDANTS UNION  
>  
> -----Mensaje original-----  
> De: Judy Spira [mailto:jbspira@flash.net]  
> Enviado el: domingo, 03 de diciembre de 2000 18:40  
> Para: stavla@stavla.org  
> Asunto: Can you download????  
>  
> The Flight attendant Health survey at  
> <http://home.flash.net/~jcspira/sofas.html>  
>  
> Let me know if the problem is corrected.  
>  
> Judy Spira

RE: Can you download????

**Subject:** RE: Can you download????  
**Date:** Sun, 3 Dec 2000 19:06:26 +0100  
**From:** "STAVLA" <stavla@stavla.org>  
**To:** "Judy Spira" <jbspira@flash.net>

Yes it is working right.

We have sent it to several female flight attendants. will you be so kind as to send us your report on this subject?

thanks  
ARTURO ROSA GUARDIOLA  
STAVLA  
SPANISH FLIGHT ATTENDANTS UNION

-----Mensaje original-----  
De: Judy Spira [mailto:jbspira@flash.net]  
Enviado el: domingo, 03 de diciembre de 2000 18:40  
Para: stavla@stavla.org  
Asunto: Can you download????

The Flight attendant Health survey at  
<http://home.flash.net/~jcspira/sofas.html>

Let me know if the problem is corrected.

Judy Spira

RE: PhD research online survey for FA's

**Subject: RE: PhD research online survey for FA's**

**Date:** Tue, 9 Jan 2001 07:26:13 -0500

**From:** "Bruno Di Giulio" <bdigiulio@local4004.com>

**To:** "Judy Spira" <jbspira@flash.net>

Hi Judy:

I think the best method is direct handout of the survey. I am at our airline division conference right now and i am meeting with 100 union representatives across the country.

If you could get me a copy of thes survey i would be glad to circulate it.

In addition, I have approximately 3100 f/a's in Toronto and I could make the survey available to them as well.

Let me know.

Bruno

-----Original Message-----

From: Judy Spira (<mailto:jbspira@flash.net>)

Sent: Monday, January 08, 2001 1:28 PM

To: Bruno Di Giulio

Subject: Re: PhD research online survey for FA's

Dear Bruno..

Update for you on the PhD research survey.....still has low results, and am hearing from the comments section of the survey that many of the FAs are not computer owners or computer comfortable...I have been trying ti think of other alternatives before the survey closes down next month...tell me what you think could increase the #s of respondents...

1. passing out surveys (takes 3-4 mins) at a large gathering...but where are these gatherings???

2. sending stacks to union offices

3. standing bu an OPs center and handing out surveys

4. placing the survey IN the professional newsletter....it appears just the address STILL isn't getting a response.

Please, Bruno send me any ideas you have.....thanks

judy

Bruno Di Giulio wrote:

> Hello:

>

> I will be posting a link to your survey on our web site very shortly. I

> would appreciate receiving results when u have them available.

> If we can be of any further assistance, please let me know.

>

> Regards,

>

> Bruno Di Giulio

>

RE: PhD research online survey for FA's

**Subject: RE: PhD research online survey for FA's**

**Date:** Tue, 28 Nov 2000 15:01:13 -0500

**From:** "Bruno Di Giulio" <bdigiulio@local4004.com>

**To:** "Judy Spira" <jbspira@flash.net>

Hello:

I will be posting a link to your survey on our web site very shortly. I would appreciate receiving results when u have them available. If we can be of any further assistance, please let me know.

Regards,

Bruno Di Giulio

-----Original Message-----

From: Judy Spira (mailto:jbspira@flash.net)

Sent: Tuesday, November 28, 2000 2:05 PM

To: bdigiulio@local4004.com

Subject: PhD research online survey for FA's

I have just put my PhD research survey online at  
<http://home.flash.net/~jcspira/sofas.html>

My dissertation topic is "The incidence of breast cancer among domestic and international flight attendants". Please feel free to post and encourage any of your FA's to participate in the study. Thank you.

N.B. The survey will be open only for the next 4 weeks. It takes approximately 5 mins to fill out. Results will be sent to the Webmaster upon request as soon as the statistical procedures have been completed.

Thank you.

Judy Spira RN. PhD candidate  
Texas Womans' University  
Denton, Texas  
USA

Re: PhD research survey

**Subject:** Re: PhD research survey  
**Date:** Tue, 28 Nov 2000 12:24:03 -0700  
**From:** "webmaster" <laurel006@netzero.net>  
**Reply-To:** "webmaster" <webmaster@iam1997.org>  
**To:** "Judy Spira" <jbspira@flash.net>

Dear Judy, Thank you for notifying me of your research survey on breast cancer among flight attendants. I think it is an extremely important research project and one that our members will be interested in. I have put a link on our website under Health and Safety and hope that our members will help your project. Please if you would be kind enough to send the results to me when the study is finished I would be grateful. Good luck and thank you for your work in this important cause. Sincerely, Laurel Stafford,  
Webmaster@iam1997.org

----- Original Message -----  
From: Judy Spira <jbspira@flash.net>  
To: <webmaster@iam1997.org>  
Sent: Tuesday, November 28, 2000 11:31 AM  
Subject: PhD research survey

> I have just put my PhD research survey online at  
> <http://home.flash.net/~jcspira/sofas.html>  
> My dissertation topic is "The incidence of breast cancer among domestic  
> and international flight attendants". Please feel free to post and  
> encourage any of your FA's to participate in the study. Thank you.  
>  
> N.B. The survey will be open only for the next 4 weeks. It takes  
> approximately 5 mins to fill out. Results will be sent to the Webmaster  
> upon request as soon as the statistical procedures have been completed.  
>  
> Thank you.  
>  
> Judy Spira RN. PhD candidate  
> Texas Womans' University  
> Denton, Texas  
> USA  
>  
>  
>  
>

Re: Women's Health Survey

**Subject: Re: Women's Health Survey**  
**Date: Sat, 24 Feb 2001 23:30:13 EST**  
**From: VirginiaStogner@cs.com**  
**To: jbspira@flash.net**

HI, Judy:

I'm going to forward both your e-mails to Rikki (our Secretary-Treasurer), who requested we get the information.

If you mail the surveys on Monday, we won't get them before Tues, so it might not be a bad idea to fax the requested info. by Monday (along with one copy of the survey) so we'll have the information for our Executive Cmte. meeting at 11 am on Tuesday. That way we can try and get the ball rolling on approval, strategies for dissemination, etc. Is the survey only targeted towards women? If so, 2,500 to 3,000 might be enough. Do you really want to include return postage, as that might get a little expensive. I know it increases your response rate, but I want to make sure we've been approved to do this before you spend alot of money.

Our fax no. again is (281) 449-2225. My home no. is (713) 988-0008, but I'll be out of town on Sunday night. I will also forward to you our Local's e-mail address in case you want to e-mail any of the documents, etc. It may be easier for me to print the stuff from the office.

Take care,

Ginny Stogner



Re: Women's Health Survey

**Subject: Re: Women's Health Survey**

**Date:** Sat, 24 Feb 2001 18:20:37 EST

**From:** VirginiaStogner@cs.com

**To:** jbspira@flash.net

**CC:** bwfb@swbell.net, deerdominguez@webtv.net, RIKKISCAT@aol.com

Dear Judy:

Just send down as many surveys as you can. We have about 4,000 flight attendants in Houston, probably 60% of whom are women.

Also, our Secretary-Treasurer has a Ph. D. and said that we need to know the following to get approval to disseminate:

- 1) what level of confidentiality is provided to the respondents?
- 2) do you have a copy of the human subjects cmte. approval?

Let us know, and we look forward to working with you.

Ginny Stogner  
LL 2339H

Women's Health Survey

**Subject: Women's Health Survey**  
**Date: Fri, 23 Feb 2001 21:23:15 EST**  
**From: VirginiaStogner@cs.com**  
**To: jbspira@flash.net**

Hi, Judy:

My name is Ginny Stogner and I am an officer with the International Association of Machinists, which represents over 9,000 flight attendants at Continental and Continental Express. Perhaps we can help you disseminate your survey before the 3/15 deadline.

Our Houston meeting is Tues, 2/27, and our other bases meet at different times of the month. Our fax No. in Houston is 281/449-2225.

Our mailing address is IAMAW, 15710 JFK Blvd, Houston, TX 77032. Our phone no. is (281) 449-2233.

Thanks!

Ginny Stogner  
Recording Sec'y, LL 2339H

Re: Health Survey Help

**Subject: Re: Health Survey Help**

**Date:** Tue, 19 Dec 2000 20:00:56 EST

**From:** SKYDOLLNW@aol.com

**To:** jbspira@flash.net

i am a f/a with nwa and have just received the info about the health survey today but didnt actually get the survey. a good idea if possible is to be able to put the health surveys in pur mail boxes at each base with nwa ok and also on line but alot of people are not online and putting it our mailboxes or even setting up a table for one day to have people fill it out will get responses but being able to put the questionnaire in our boxes would reach the majority of f/a's and i am sure make your research better- just an idea and this can be done with all airlines. just a thought. good luck and hope that you continue to ook into our health as the radiation and other effects that we are exposed to daily does take a big toll besides the noise factor which is terrible and we all know it.  
sincerely,  
sabrina druit dtw based f/a for nwa

Re: Health Survey Help

**Subject: Re: Health Survey Help**

**Date:** Wed, 20 Dec 2000 18:57:33 EST

**From:** SKYDOLLNW@aol.com

**To:** jbspira@flash.net

i believe that vyou could talk to our union which is IBT. we have a new executive committee taking over the reins in jan and danny campbell is our new president and i feel that he is very much behind us and also with helping out on things like this. there is a no here you can ring though i dont know if there will be many people here around the holidays but here is both the dtw and the msp union no.s  
also you may talk to hdq nwa in msp but talk to the unions first as they would be able to adv on the legal stuff.  
1-800-428-3892 for dtw and you may try 1-800-428-msp2 for msp or ask dtw for the no. they can direct you to the right people be it union or the nwa mgmt person that you can ask to be able to pass out the surveys.  
every base has a mailbox for each employee like flight attndt's ,pilots, etc. possible the union could help in passing htese out if they can be cleared. just a thought but i hope that this is a starter. best of luck and i will try to direct you more if you nn it. happy holidays sabrina

Need web site for Spira Online Flight Attendant Survey.

**Subject: Need web site for Spira Online Flight Attendant Survey.**

**Date:** Wed, 3 Jan 2001 14:55:30 EST

**From:** LISATWU5@aol.com

**To:** jbspira@flash.net

Judy,

I was forwarded your online survey but did not receive the web site address. I am an organizer for the Transport Workers Union and am presently organizing the Delta Flight Attendants. I would like to forward this information to as many F/A's as I can. I was also a Flight Attendant for 16 years and have seen more than I care to see of Breast Cancer victims.

Please forward me the web site so I may inform others.

Thank you,  
Lisa Frost TWU Organizer

bill

**Subject: bill**

**Date: Tue, 28 Nov 2000 12:38:48 -0600**

**From: bill.autoresponder@afa-airtran.org**

**To: jbspira@flash.net**

Your e-mail has been sent to me. As soon as I get a chance, I will respond or forward your request/question to a committee or person that can best address your e-mail. Please be advised that it may take me or a committee member a few days to respond to your e-mail. You can also locate specific committees or LEC's online via our websites at [www.afa-airtran.org](http://www.afa-airtran.org) or [www.eastregionmec.org](http://www.eastregionmec.org) and e-mail them directly. Thank you.

Bill Green  
AFA LEC 57 President  
AFA Eastern Region MEC President

Re: Data posted to form 1 of <http://www.flightattendants.org/links.htm>

**Subject: Re: Data posted to form 1 of <http://www.flightattendants.org/links.htm>**

**Date:** Wed, 29 Nov 2000 04:00:40 -0500

**From:** "Admin" <admin@flightattendants.org>

**To:** <jbspira@flash.net>

Judy,

By all means, please feel free to post this message on the Flight Attendant Discussion Forum.

Visit <http://www.flightattendants.org>, click on "Flight Attendants" and then select "Discussion Forum". From there you will be able to post a link to your survey and a description of what it is about.

Unfortunately, I am not able to add it to the "Aviation Links" section of FlightAttendants.Org due to the time sensitive nature of your site. It is difficult to keep up with "dead links" already, and I fear that I would forget to delete your link until it is too late.

Best of luck and Seasons Greetings!

Jason  
Administrator,  
FlightAttendants.Org  
admin@flightattendants.org

----- Original Message -----

From: <webuser@flightattendants.org>

To: <SkyYYZ@flightattendants.org>

Sent: Tuesday, November 28, 2000 1:20 PM

Subject: Data posted to form 1 of <http://www.flightattendants.org/links.htm>

>

.....

\*\*\*

> Category: General F/A Interest  
> SiteName: Breast cancer PhD research  
> SiteURL: <http://home.flash.net/~jcspira/sofas.html>  
> UserName: judy spira  
> UserEmail: jbspira@flash.net  
> B1: Submit  
> Remote Name: 206.71.96.3  
> HTTP User Agent: Mozilla/4.75 [en]C-CCK-MCD NSCPCD47 (Win98; U)  
> Date: 28 Nov 2000  
> Time: 01:20 PM

>

> Comments:

>

> I have just put my PhD research survey online at  
> <http://home.flash.net/~jcspira/sofas.html>  
> My dissertation topic is "The incidence of breast cancer among domestic  
> and international flight attendants". Please feel free to post and  
> encourage any of your FA's to participate in the study. Thank you.

>

> N.B. The survey will be open only for the next 4 weeks. It takes  
> approximately 5 mins to fill out. Results will be sent to the Webmaster  
> upon request as soon as the statistical procedures have been completed.

**Subject:**

**Date:** Tue, 2 Jan 2001 13:50:23 -0800 (PST)

**From:** Nancy Chin <nwchin@yahoo.com>

**To:** jbspira@flash.net

Dear fellow flight attendants, please do not take personal offense to my statement here.

In regards to the survey, I am ashamed to say that since our job as a flight attendant does not required us to have a laptop or computer, or BASIC fundamental technical skills, most of us therefore do not even own a computer at home nor do we even know how to use one. How effective then would communicating to this group be via the web???? Granted there are exceptions to a group of us who tried on our own not to get left behind on the internet highway.

My recommendation therefore is to use the old fashion technique of print communication for your survey since ALL airline employees receive a newsletter on a monthly or semi-monthly basis, and of course to continue to use the web to reach those of us who have access to it for quicker and more efficient response.

Good Luck!  
Nancy Chin  
NWA -SFO

thus (I would even venture to say some of us do not even know how to turn the computer on to access our monthly bidding via the compuserve winzitem software to do our monthly bidding....

---

Do You Yahoo!?

Yahoo! Photos - Share your holiday photos online!

<http://photos.yahoo.com/>



**Subject: Flight Attendant Health Survey**  
**Date:** Wed, 20 Dec 2000 13:31:33 +1100  
**From:** "Susan Brookes" <sulub@ozemail.com.au>  
**To:** "Judy Spira" <jbspira@flash.net>

Hi Judy,

I have printed out your survey. The FAAA is currently in the throes of organising a national flight crew cancer survey which I have been planning for two years with the help of the Victorian (State) Anti-Cancer Council epidemiologist, Dr Graham Giles. I have been given permission to go ahead with my survey in early 2001 and have the format already set. It is a four page document which will survey all Flight Crew (Pilots, Engineers and Cabin Crew). I hope to encompass about 10,000 responses. I have been advised that a large number of negative diagnosed responses are necessary to form a comparative basis for the study. It will be my task to encourage everyone to respond, whether they have been diagnosed with cancer or not. All cancers are being surveyed.

Breast Cancer is a major concern for cabin crew but not the only one. Also, we are able to compare our positive results against the National Cancer Register, here in Australia to determine the validity of the positive response data.

Cabin crew in Australia do not have a high rate of PC usage, and only a percentage would be on the internet. Therefore, I do not believe that your website will glean the responses you require. Also, cabin crew do not have the opportunity to gather in large groups without calling stopwork meetings, which are considered industrial action in Australia. So, although a visit to Australia might be nice, I really don't know of any large gatherings of cabin crew which you could attend.

If you would like the information we obtain from our survey, probably by the end of 2001 it will be finalised, we could certainly arrange for it to be forwarded to you. I have a feeling that this may be too late for your funding though.


However the questions you ask are specific to breast cancer, to cabin crew and some are more detailed than those on our survey. It is probable that information received from this initial general cancer survey will lead to further, more specialised studies because we have asked crew to give permission to be further surveyed if a positive response given to the positive diagnosis question.

I hope this has been of some use to you Judith.

Let me know if there is anything further we can do.

Cheers,

Susan B.  
FAAA  
Occupational Health and Safety  
Convenor - Ansett

 S.B. 0172.doc	<b>Name:</b> S.B. 0172.doc <b>Type:</b> Download File (application/msword) <b>Encoding:</b> base64
---	--

EX-SYD is out

**Subject: EX-SYD is out**

**Date:** Sat, 23 Dec 2000 11:32:33 +1100

**From:** "Wesley Jones" <wesley@one.net.au>

**To:** "Judy Spira" <jbspira@flash.net>

Judy,

As it is Xmas, there is a lot of printing being done and it has been a bit slow, also the post is in great demand. EX-SYD was delivered early this week and you should be getting some responses soon. I hope it is susessful. Hope to hear from you with some good responses and if some more of my input I will help. If the survey brings about a negative for female flight attendants, I would like to know and may have to report it. I am leaving today for cold London (yesterday here it was 108F) hope you have a great Chrissie

Wesley

----- Original Message -----

From: "Judy Spira" <jbspira@flash.net>

To: <wesley@one.net.au>

Sent: Tuesday, December 19, 2000 2:25 PM

Subject: Need 5 minutes of your help....

> the survey response rate has been "seasonally" slow and I fear for  
> future University and outside funding for future research on FA Health  
> issues.  
>  
> I have not received any responses from Austrailia ( a very important  
> site). I went to the webpage and emailed all 4 regions and tried to call  
> directly to see if I should FLY DOWN and collect/administer the survey  
> face-to-face. I have not received any email answers and am not sure the  
> phone numbers (or my dialing process) is right.  
>  
> Wesley, what, in your opinion, is a method to increase response rate in  
> Austrailia (or is it proper to say "down under")?  
>  
> 1. Advertise the online website at  
> <http://home.flash.net/~jcspira/sofas.html>  
> 2. Have a "tear out" page in the professional newsletter  
> 3. Have me fly down and administer to large assembled groups (takes 5  
> mins to do the survey)  
> 4. Add to the chat or discussion room, if available.  
>  
> Let me know what you think.  
>  
> Happy and safe Holidays to you and yours!  
>  
> I will keep you posted on the results.  
>  
> Thanks again, Wesley,  
>  
> Judy Spira RN PhD candidate  
> Health Sciences  
> Texas Womans' University  
> Denton, Texas  
> USA  
>  
>

[ [Reply](#) | [Next](#) | [Previous](#) | [Up](#) ]

## 5 minutes Help needed from "ALL" Flight Attendants

**From:** Texas Womans' University

**Email:** [jbspira@flash.net](mailto:jbspira@flash.net)

**Remote Name:** 198.77.116.58

### Comments

CAN YOU PLEASE participate in the following online Flight Attendant Health Survey for PhD candidate Judy Spira. The "online" Survey is ending soon. Future funding is at risk for FA Health research with current low seasonal response rate.


ONLY TAKES FIVE MINUTES!!!

<http://home.flash.net/~jcspira/sofas.html>

Thank you so much for your contribution to health!

---

**Last changed:** December 18, 2000

Author	Post
<b>Judy Spira</b> Registered Crewmember (12/19/00 7:32:58 pm)	 <b>5 minutes HELP needed from ALL FA's for Health!</b> <p>Please fill out the Texas Womans' University PhD researcher Judy Spira's online health survey for FA's. Hello to all AGAIN! Thank you so much for helping me in my health research for Flight Attendants through Texas Womans' University. I now find myself asking for your help.</p> <p>To date, I have received only 70 (seventy) online surveys from flight attendants, and I fear I will not get funding for future research related to the health of Flight Attendants if I cannot get a better response. Could you help me? Should I:</p> <ul style="list-style-type: none"> <li>· put the survey in a newsletter to be torn out and mailed?</li> <li>· continue reminding webmasters to keep it posted online?</li> <li>· fly down to different locations and administer the short survey to large, already assembled meetings/groups?</li> </ul> <p>Thank you for your input, the data collection online is easiest and takes 3-5 minutes. Hopefully, I will have more participation and may continue this FA research.</p> <p>Thank you so very much,</p> <p>Judy Spira RN PhD candidate  Texas Womans' University  Denton, Texas  USA</p> <p>Address is : <a href="http://home.flash.net/~jcspira/sofas.html">http://home.flash.net/~jcspira/sofas.html</a></p>

This is only a PREVIEW of your message. To really post this message please click on the **ADD POST** button. If you wish to correct your post, just hit the **BACK** button on your browser and make the desired changes

Add Post

# our safety

● join us!  
● [jointogether@deltaafa.org](mailto:jointogether@deltaafa.org) — an email forum

Association of Flight Attendants

Delta Air Lines

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validity](#)

[working  
together  
works](#)

[around  
the system](#)

[in our bases:](#)

● [Flight Attendant Health Survey: Judy Spira's research to assess and compare the incidence of breast cancer among domestic and international flight attendants on United States' commercial carriers](#) — 11/29/00

● [Managers would listen to our concerns about cabin hazards if we had our own association](#) — 8/23/00

● [We finally win federal safety protections](#) — 8/23/00

● [Our Safety Should Count Too!](#) — 8/17/00

● [Safety Hazard Reporting Form](#) — 8/17/00

● [OSHA Victory!](#) — 8/3/00

● [We're passenger safety pro's, but oursafety counts, too!](#) — 8.1.00

● [Survey results are in: We say our safety should count, too!](#) — 8.1.00

● [Our safety counts, too!](#) — 7.30.00

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OUR SAFETY  
should  
COUNT, TOO!

## ALL FA's PhD Researcher NEEDS 5 minutes if INTERESTED IN THEIR FLIGHT HEALTH

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Posted by JSpira on December 23, 2000 at 01:10:15:

Thank you so much for answering this research query...here is the address to the survey (please feel free to pass it on to other FA's before I close the site in about a month).

<http://home.flash.net/~jcspira/sofas.html>

Thank you again so very much!!!  
Happy Holidays to you and yours!!!

Judy Spira RN PhD candidate  
Texas Womans' University  
USA

Follow Ups:

Post a Followup

Name:

E-Mail:

Subject: Re: ALL FA's PhD Researcher NEEDS 5 minutes if INT

Comments:

: Thank you so much for answering this research qu  
: <http://home.flash.net/~jcspira/sofas.html>  
: Thank you again so very much!!!  
: Happy Holidays to you and yours!!!  
: Judy Spira RN PhD candidate  
: Texas Womans' University  
: USA





confirmation

Thank you, **Judy Spira** . Your article, titled **PhD researcher Judy Spira posts FA health survey**, has been submitted to the *Flight Attendant Discussion Forum*. Messages are periodically reviewed and may be purged in accordance with the guidelines of this forum. A separate forum has been established to answer the questions of our future colleagues.

Thank you for participating. Please be sure to tell your colleagues about the existence of this web site!

If you refresh the main page you should see your new article appear in the list.

\* Note Your Internet Service Provider and Computer name have now been logged

APPENDIX G  
Expert Committee Letters





Delta Air Lines, Inc  
Department 031  
Post Office Box 20706  
Atlanta, Georgia 30320-6001

November 30, 2000

Judy Spira  
12538 Chisum Road  
Sanger, Texas 76266

Dear Judy:

This letter confirms my participation in your doctoral study. It is an honor to be asked to be a member on your expert panel for your dissertation research entitled "The incidence of breast cancer among domestic and international flight attendants." You have my permission to use any information or inputs supplied.

I would be very pleased to provide you any technical information or assistance you need in designing, editing, and assessing the readability, relevance and content validity of an online flight attendant health survey. I wish you success in your study and I am looking forward to reviewing your findings.

Sincerely,

A handwritten signature in cursive script, reading "James T. Fitzgerald".

Col. James T. Fitzgerald, USAFR  
BS, MBA, B-777 pilot, Delta Air Lines



February 09, 2001

Judy Spira  
12538 Chisum Road  
Sanger, TX 76226

Dear Ms. Spira:

Thank you for inviting me to be a member of the expert panel for your dissertation research study titled "The Incidence of Breast Cancer Among Domestic and International Flight Attendants". It was my pleasure to assist you in assessing the readability and face content validity of your online instrument, the "Flight Attendant Health Survey". As you well know, women experiencing breast cancer have been a professional interest of mine in nursing practice, education and research for almost 2 decades.

Since obtaining a Master's degree in Oncology Nursing and Management in 1988, I have provided direct care to these women at many stages of the disease and in a variety of settings, including Blood and Marrow Transplantation Units. I have taught the breast cancer curriculum content in undergraduate and graduate level nursing programs. My own doctoral dissertation titled "Effect of Subcutaneous G-CSF Injectate Volume on Drug Efficacy, Site Complications, and Client Comfort", was published in the January 1999 issue of *Oncology Nursing Forum*. The population I studied consisted of women undergoing autologous stem cell or bone marrow transplantation for high risk locoregional or metastatic breast cancer.

My most recent publication related to breast cancer, co-authored with Mary Ann Kelley, is a review of current knowledge of the screening and early detection practices of minority women in the United States. The piece will be published in the April 2001 "Oncology Update" supplement of the *American Journal of Nursing*. My interest in this specific topic grew from my participation in the "Cancer Prevention and Early Detection Program for Nurse Educators" funded by the Oncology Nursing Society and the National Cancer Institute.

In my current position in Scientific Field Operations with Novartis Pharmaceuticals, I interact regularly with clinical investigators conducting trials with compounds used in hormonal therapy for breast cancer and the management of bony metastasis in advanced stages. The company also has several new compounds in pre-clinical development that I will be helping to place at clinical trial sites in the near future.

I wish you great success in this study, as you strive to add to the body of knowledge related to the risk factors of breast cancer. I look forward to reading a report of your findings.

Best regards,

A handwritten signature in cursive script that reads "Anita L. Comley".

Anita L. Comley, PhD, RN, AOCN  
Oncology Associate,  
Scientific Field Operations  
Novartis Pharmaceuticals

Andrew F. Giesen, M.D.  
558 Mooney Road  
Ft. Walton Beach, FL 32547

December 04, 2000

Judy Spira, PhD candidate  
Health Studies Department  
Texas Woman's University  
P.O. Box 425677  
Denton, TX 76204-5677

Dear Ms. Judy Spira,

This letter serves to confirm my decision to participate in your doctoral study. Thank you for asking me to be a member of your expert panel for your dissertation research entitled "The incidence of breast cancer among domestic and international flight attendants" under the direction of Dr. Mary Shaw.

I would like to assist you in assessing medical material that is included in your flight attendant health survey. My background is in the specialty of radiology, primarily in the diagnostic field in recent years. Prior to that, in the early days of my practice, some radiation therapy was performed. In completing the residency in radiology, I was certified by the American Board of Radiology and later was honored to be elected a Fellow of the American College of Radiology on the basis of activities in this specialty.

In addition to this, in the late 1970's it was my privilege to be President of the Southern Medical Association having served in the section on radiology for several years. My professional practice was that of head of the Department of Radiology at the Fort Walton Beach Medical Center, being the senior member in a department of four radiologists. Since 1993, I have been retired, but continue some medical education studies. It will be a pleasure to serve on this panel for your dissertation research. If there is any problem evaluating your material, I do feel that the resources are available for me to check the validity of the research. In the meantime I remain

Sincerely yours,



Andrew F. Giesen, Jr. M.D., D.A.B.R., F.A.C.R.

January 16, 2001

Dissertation Committee  
Texas Woman's University

T. J. Norris, Esq.  
1104 Trimm  
Pasadena, TX 77502

**RE: Doctoral Candidate, Judy Spira**

Dear Sirs/Madams,

I write to you today in support of Ms. Spira's Doctoral Candidacy and specifically, her tireless work in the gathering of scientific data related to the incidence of breast cancer among international aviation crewmembers.

I first became aware of the alarming frequency of certain cancers (particularly breast cancer) among my colleagues years ago. Quite accidentally, I had stumbled upon an Advisory Circular bearing the seal of the Federal Aviation Administration which purported to show a relationship between radiation exposure aloft and breast cancer in flight attendants. To my knowledge, the Circular had never been brought to the attention of rank-and-file flight attendants by either the air carrier business community or by our own unions, so I republished it myself on my website, [airlineLABOR.com](http://airlineLABOR.com).

Simultaneously, and perhaps not without coincidence, the popular aviation press, together with agencies such as NASA, began to call our attention to a possible relationship between our star's solar maximum (11 year) cycle and all types of childhood cancer and leukemia in the children of aviation crewmembers, as well as substantial clusters of breast cancer among our international crews. Whether this clustering could be correlated with the routes these crewmembers were accustomed to flying habitually over many years and the corresponding magnetic field contours at that latitude was unknown and remains unknown. It is this piece of the puzzle Ms. Spira has attempted to tease out.

The aviation community in general was notoriously slow to turn their attention to the issue of second-hand cigarette smoke and we can expect some foot-dragging here as well. But, just as we could no longer ignore cigarette smoking's relationship to various cancers and lung ailments, we cannot now ignore the suggested link between female sex tissue cancers and high altitude radiation. In the human male, (still most of the cockpit crewmembers) the sex gamete cells are made new out of whole cloth every day. The human female (still the overwhelming majority in the cabin crewmember position) is born with her's and any insult to them is cumulative. Sex hormone sensitive tissues, including the human egg cell, are notoriously vulnerable to radiation damage, which is why one's dentist puts a lead apron on you when you get a tooth x-rayed and why any responsible health care provider asks you "Could you be pregnant?" before taking any kind of x-ray.

If the relationship between high altitude radiation and female cancer were to hold up to close scrutiny, then our unions and employers would in all likelihood be forced to save face by negotiating important workplace protections, including radiation badges which register cumulative doses, pay protection for those seeking to recover from cancer related illnesses in themselves and their children, regular pre-paid medical screening and so forth.

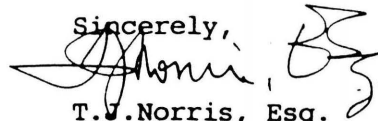
I have worked as a cabin crewmember in aviation for twenty-eight years and obviously, I have a personal stake in the confirmation or rebuttal of the suggested link. As a lawyer, I also have an interest in what I consider a duty to fairly warn. As a woman, I have an agenda to not be swept-under-the-rug, not be last-in-line, not be overlooked.

I have reviewed Ms. Spira's survey and collaborated with her in her quest to reach the largest possible crewmember audience. I edit and publish an independent union press, [airlineLABOR.com](http://airlineLABOR.com), and have made this venue available to Ms. Spira. I have cyber-introduced her to a number of my colleagues operating similar websites at other carriers and at various governmental agencies. I

have been her advocate when I have been able and her admirer when I could not.

I encourage you to support and ratify her efforts to collect this important data. Please let me know if I can be of further assistance to you in your evaluation of the merits of this case.

Sincerely,

A handwritten signature in black ink, appearing to read 'T.J. Norris', with a stylized flourish at the end.

T.J. Norris, Esq.  
President,  
airlineLABOR.com;  
State Bar of Texas;  
American Airlines,  
Flight Attendant;  
APFA Union Member

cc Judy Spira, RN

November 28, 2000

Judy Spira, PhD candidate  
Health Studies Department  
Texas Woman's University  
P.O. Box 425677  
Denton, TX 76204-5677

Dear Ms. Judy Spira,

This letter serves to confirm my decision to participate in your doctoral study. Thank you for asking me to be a member of your expert panel for your dissertation research entitled "The incidence of breast cancer among domestic and international flight attendants" under the direction of Dr. Mary Shaw.

I would like to assist you in assessing the readability and content validity of your online flight attendant health survey. I am also willing to answer any questions pertaining to inflight experiences of flight personnel. I have been a flight attendant for over 14 years and I also hold a commercial, instrument, multiengine, and flight instructor ratings.

Finally, I wish you success in your study and look forward to a report of your research findings.

Sincerely,

A handwritten signature in cursive script that reads "Leanne Olds". The signature is written in black ink and is positioned below the word "Sincerely,".

Leanne Olds

**APPENDIX H**  
**Survey Comments**



## **SURVEY COMMENTS:**

Breast Cancer in Situ Stage II diagnosed in November 1973 at age 45. Treatment included 3 months of chemotherapy and 11 weeks of radiation. Regular checkups confirm cancer free status for the past 7 years.

In 1998 I was diagnosed with DCIS, which I am told is considered pre-cancerous. Although I have not suffered from breast cancer over the years I have been a flight attendant I have had so many friends who have! Some are doing fine some have had recurrences of their cancer and many have died. I am glad that someone is finally doing this study. Thank you.

I no longer fly. I have had breast cancer metastasized to liver and bones in 1996. I am a part of the flight attendant class action lawsuit concerning second - hand smoke and FA. I flew during the time there was a great deal of smoke in the planes.

I am currently wearing a dosimeter to measure cosmic radiation exposure.

I have been going to a breast cancer specialist. He has indicated an interest in a study like yours because he has an unusually large number of flight attendants in his practice. In fact he contacted Mr. XXX, (senior vice president, name withheld) about such a study. Perhaps you would like to contact him (Dr. Name withheld at phone XXX).

I fly express aircraft D-8's reserve flight attendants fly whatever trip is available. Out of our particular base the flights are on average 3-4 hours. Also several of my flights in the last year have been 6 hours, or 11. My aunt and grandma died of breast cancer. Aunt at 38. Grandma in her 60's.

I fly on turbo props. For the last 3 years, I have worked at the APFA. I have flown very little, so my results could be skewed.

Although I have not been diagnosed with breast "cancer", I have had to have 2 biopsies done in the past 8 years. One surgery a cyst was removed. In addition I have had menstrual difficulties that two different physicians have said can be associated with my job as a flight attendant i.e. hours flown and body clock problems.

Diagnosed with breast cancer 12 years ago. Had a lumpectomy with no lymph node involvement. Had radiation after surgery. Have been cancer-free since then.

I am not sure of the questioning for type of aircraft. I have flown full time through-out my career, but on various aircraft.

Not sure if this info will help- I am a reserve FA so they call me for any flights they need me for, so I get a wide range of destinations and aircraft types.

I am on reserve, therefore I fly a variety of aircraft (narrow & wide body). I have only been a flight attendant for 3 years and the health issues are one reason why I am in the process of seeking a new career. I would like to mention that child conception is a concern of mine. Within my own findings many flight attendants try for years to have children with no results. I hardly believe this is a coincidence. Finally, I have had more sinus infections and respiratory problems (I am a non smoker) in the past three years than ever before. Once you have completed your research, I would appreciate a copy of your report. If I may be of any other assistance, please do not hesitate to ask. Thanks- email address withheld. \*\*

I attended TWU!!!!!! (Denton) I am no longer flying. I went on maternity leave when I found out I was pregnant (fear of radiation etc. exposure to fetus.) I opted not to return. Thankyou for allowing me to participate in this survey!!! \*\*

You need to possibly include studies into reproductive organs and the muscle/skeletal injuries, joint injuries are also common i.e. rotator cuff/ wrist/ back etc.

I am on reserve, so I fly both domestic and international. My grandmother had breast cancer. I have had 2 miscarriages as a flight attendant.

I am still on reserve and fly whatever they give me.

My schedule is primarily a domestic, narrowbody one now, but 1989-1991 was primarily international, wide-body flights. My domestic schedule varies from very short flights to those over 3 hours. My maternal Grandmother had breast cancer in 1993 and is still with us. I have had at least 3 mammograms due to lumps in my breasts; fibrocystic breasts run in the family. Hope this helps! Good luck.

I have had a breast biopsy in January 2000, which was benign.

I am currently very concerned about the risks associated with radiation resulting from flying long international routes over an extended period of time. I have heard that levels of radiation increase dramatically when there is a marked increase in the frequency of solar storms. With this coming week being just such a period, I believe measures need to be taken to protect the health of crew members who are regularly exposed to such risks.

Sister died from breast cancer Mother had mastectomy a year after sister's death. Good luck on your survey, I would like to know how it comes out for you. Name withheld.

We are exposed to various contagious diseases constantly. I have been exposed to TB on one occasion that I know of because I was notified of it by a supervisor at my airline. The

airlines save money by turning off one of the air packs that filter the cabin air (they save fuel). This causes less O2 also in the cabin. Cabin air is EXTREMELY unhealthy.

Ovarian cancer found in Feb of '88 Hysterectomy and Chemo from Mar '88 to August '88. check ups ok to date.

I am an injured flight attendant from a flight in August 22, 1999 - smoke in cabin for approximately 3 hours. The same symptoms I experienced on the flight then started to re-appear plus other weird symptoms approximately 1-2 months after the flight. Inflammation uterine infection lesion in the brain numbness and tingling in hands, feet, arms, and legs. Severe twitching and coughing when on the airplane. This is all similar to other flight attendants who are sick. Combination of my incident, the jet fuel, and the oils and hydraulic fluids (TCP's) that drip into the bleed air system then get circulated in the air. I have obtained many documents that show this and you can contact XXXX (name withheld) for this information. There are many sick FA's at every airline and in every country. Airlines do not want to recognize the injuries and has been a battle to fight for benefits. If there is any more information you need from me, please don't hesitate to contact me at XXXX (email withheld). Thanks for doing this study - it is greatly needed.

My average flight is never less than 3 hours long.

I am aussie and american. I worked for UA in Syd for 5 1/2 yrs and I was going intl to somewhere about once a month as a pax then started flying as a f/a in 93 in the states domestic narrow for 3 1/2 yrs now on reserve and do both intl and domestic and all various flt time lengths.

About 80% of my trips are flown on the DC-9 so I tend to work 3-5 short legs a day (about 13 days a month). I fly international maybe 6 times a year. I commute 4 hours each way about 3 times a month (24 hours total).

I've had breast biopsy (neg.) 3 yrs ago and abnormal pap smears (multiple Also notable is that my flights are all on the "polar route" (more radiation due to the hole in the ozone in that area). Also, I "commute" which adds about 4 hours per trip. Thank you for any findings reported to our Union.

I have flown part time or have been on leave since my children were born 6 years ago. Before that I flew mainly Chicago- San Juan 9 months--Europe the other 3 months. I have had a mammogram - because of my sister's breast cancer-but I am fine so far.

A lot of time you'll see in the cockpit that the altitude is 37,000 to 38,000 feet -thank you for doing this research!

In the last year I have experienced neck and shoulder pain. My doctor says that I have degenerative bone loss in my neck as well as arthritis.

The first 11 years of my career I flew 75 hours of narrow body domestic. The last 13 years I have flown a mixture of mostly International wide body with some Honolulu and domestic narrow and wide body in there. I have flown both short and long haul in different parts of my career. As younger people have been hired in the last 12 years, they have tended to want to fly more hours which forced my average up. I believe this is the wrong way to go.

I am a Physician of Traditional Chinese Medicine and a Flight Attendant. I have some information for you. Please call me at (name and phone number withheld). If you want any more information feel free to contact me

Diagnosed last March and going back this March. Had 8 chemo treatments (2 different ones) and 38 radiation treatments.

Good for you! I have known 7 FAs in the past few years who have had breast cancer!...

Many of my friends in my age group are getting breast cancer, many are dying. This study is very important.

This is a must study! I have too many friends with Breast Cancer.

Because of flying in smoke- filled cabins for 16 years I developed chronic asthmatic bronchitis...see written pages of health comments in letter.

1990 --The first 6 months I flew domestic and international been based in HNL since may 91 to present time. Is anyone doing research on flight attendants being able to have children?

I have had breast cancer 3 times. I have the BRCA gene. I do not fly international. I fly domestic only--1-2-3-4 day trips. A mix.

I have been flying for 1.5 years total. My flying varies from international to domestic daily as does the type of aircraft. \*\*

I took a one-year leave- therefore the discrepancy 21 years employed and 20 years of domestic flying.

For 5 yrs have flown a mix of wide and narrow body a/c in US and Mexico and Caribbean. I have not seen any studies on FAs and miscarriage; just an idea for future research!

Had a breast biopsy in Nov. 1996 and a nonmalignant lumpectomy.

I am currently working with my union and PAC-MED Osteoporosis Research Unit Seattle, WA on the long term effects of flying and bone loss.

I purify my water. I bring all my own organic food. I exercise on my days off. I supplement heavily with Shaklee. Thank you for doing this survey.

(Did not have risk factors) -4 children- breastfed all 4-non-smoker (but exposed to 10 yrs of second hand smoke on a/c-excellent phys condition slim-good nutrition

Am being watched closely, have fibrocystic breasts.

I hit menopause at age 46. 6 yrs before my mom. My mother reached menopause at 52. She had been a telephone operator.

I currently have been diagnosed with Stage 4 breast cancer. After 2 chemo. I have some shrinkages of my tumor in my lung any information you can give me would be much appreciated.

Great study good luck! I'd also love to see a FA fertility study!

I have flown maybe 24 long haul international flights. For 19 years I have flown night and early morning flights.

International/domestic flights intermixed over 16 year career. If I divided the total...3/4 of wide narrow body domestic, 1/4 wide body International. (12 yrs vs. 4 yrs).

I really feel that the newer planes (757,A320) fly or cruise at higher altitudes & this is detrimental to our health.

If you want more from me, my phone is (number withheld). Good luck.

Only 10 trips international in career. (Too bad on body). First airline - my age 20-22  
Current airline my age 47-57

I had a lumpectomy and radiation. Started yearly mammo at 45 yrs..breast cancer inside calcifications--contained.

I have made copies and sent your survey to others asking they also pass it on. Good luck.

I only do "longhaul" international 1-3 times per year when I am on reserve.

Thank you. Am concerned w/ our exposure in our job.

From personal observations it seems obvious FAs experience higher rates of miscarriage & breast cancers. Also would like to know effect of repetitive and frequent security screening and inc. its effect on always carried OTC meds, prescription meds and vitamins. I take many vitamins in hopes of diluting some of these effects & keeping my immune system up.

I fly about equal mix of both short and long segments. I have no first or second degree relatives with a history of breast cancer, but worry about all forms of cancer, possibly occurring because of the unique exposure of this job.

Flight attendants also have a very high rate of miscarriages!

Based in DFW, most flights are 2-3 hrs in length with lots of short haul under 90 mins and the occasional longhaul over 3 hrs.

I took an 8 month leave of absence back in 1992.

In 1992 or 1993, I had a suspicious mass removed.--benign but the doctor said it was pre-cancerous. So, I had it cut out.

Flight durations vary regularly.

I had Stage 1 breast cancer after 8 years of flying. I believe the radiation and lifestyle of flying contributes to this disease. Any questions - or to send me more info-- I am a psych student (undergrad) and have given this subject a lot of thought. Anything I can do to help - let me know!

This job is very tiring for the body.

Can't do international I feel "hangover".

Do you know of further health related studies pertaining to FAs? Specifically with uterine fibroids. Good Luck and thank you! (Name withheld).

Please send me info on your results if possible!! (Address/email address withheld)

( Home address, email and phone withheld).

Please send me info on your results if possible!!

I believe you are doing a much needed study and wish you the best of luck and prematurely congratulations to you on your PhD.

flies 1/2 of month in a wide body and 1/2 month narrow body

Mostly wide-body but some narrow body.

My flight time varies because I fly availability which means I don't hold a regular schedule.

My opinion is my breast cancer was stress-induced. I had been flying approximately 1.5 yrs when I was diagnosed.

I have been diagnosed with lupus fibromyalgia panic disorder osteoarthritis of the spine, myopathy, neuropathy, carpal tunnel, Raynauds disease, & various autoimmune diseases.

My mother has survived breast cancer for five years this May.

\*Questions about wide and narrow body flying. I fly wide body international flights about 1/2 of my flying, and narrow body domestic the other 1/2 of flying.

I do NOT wear underwire bras.

I fly Fokker 21/2 legs average. I had a lump removed from my breast in Dec 98-it was not cancerous.

I fly short and long segments.

I took an 8 month leave of absence back in 1992.

At my yearly visit last year my Dr found a lump and recommended a mammography. The lump turned out to be a changing cystic mass (benign).

I have talked with many flight attendants 15 plus that have had some sort of cancer. (usually breast). My grandmother had breast cancer and I am VERY concerned about the radiation exposure of FAs.

Based in DFW, most flights are 2-3 hrs in length, with lots of short haul under 90 mins & the occasional long haul over 3 hours.

Had ultrasound in Dec 2000--must have follow-up visit in June for re-check/suspected lump/mass.

My segments are 1.5 to 3 hrs.

Thank you for taking an interest in FAs health. Miscarriages, hysterectomies, cysts (ovarian and breast) etc., are high.

I flew full time averaging 78 hours for the first 18 years, the past 3 years I have flown less hours per month and taken advantage of company convenience leaves quite often. I have only flown 3 full months this year (2000).

For the past 2 years I have been flying mostly high value turns. (West coast and back to Detroit) and illegals (usually east coast with short layover and back to Detroit). Before that I flew mostly domestic 3-day trips consisting of between 3 and 5 one to three hour legs a day. I hope this is of use to you. (Name withheld).

While I am not a flight attendant with a US carrier I am a long haul flight attendant with Qantas and we found out about your survey through our Union's newsletter. I thought you might be interested in incorporating our details as well. \*\*

I had one miscarriage possibly two. My cycle has been irregular for 22 years and only recently has been regular since I started taking Levoxyl for Hypothyroid.

Many health problems should be arising from max 40% O2 in main cabin to diseases such as TB which just recirculate. Radiation exposure said to be minor --one dental x-ray the equal to one flight from Denver to Chicago. If that is minor, why is a lead apron used. Also, seems to be many cancers developing in the 25/30 year seniority. Good luck with your research and thank you for choosing this area of study.

I am a flight attendant in Canada, however, I thought that my information may be relevant to your studies. \*\*

I have had a breast biopsy done but they found no cancer and they are watching the growth every 6 months I have a mammogram.

I am a reserve flight attendant at NW Airlines. I fly a mixture of domestic and international, wide body and narrow body. I am a full-time flight attendant but I do something different every week. That makes it very difficult for me to answer these questions.

I fly both domestic and international, wide body and narrow body in the same months so the times are approximations, but fairly accurate. I took a total of 7 accumulated years off work to raise my children(I'm still not done, teens take a lot longer!). Thank you for your research in this field. Please keep me informed about your results.

At Northwest most flight attendants fly both international and domestic. When you are on reserve you don't have an option. This may make your study a little harder. You might want to contact the Flight Attendant unions to add a survey to their newsletters. Good luck!



2 of our FAs just died of breast cancer--3 more have breast cancer. Thank you for this study.

Also check on adult asthma in senior FAs. We worked in smoking cabins for years. My best friend died of breast cancer 9-26-00 after a nine-year battle.

You will find there is a high rate of sinus infections and continual sinus/upper respiratory illness.

If I can help any further with your research, please let me know. (Name address phone number withheld).