Induced Abortion Among Chinese Women: II. Health and Well-Being of Women and Children

This article is a continuation of the previous article on Induced Abortion among Chinese Women: Sociological Aspects (Research Bulletin Vol. 14, No. 1, July/August 1999). Several medical and social researchers have concluded that induced abortion is harmful to the health of women in China, although the reasons for their conclusion have not been made explicit. This article attempts to document how induced abortion is harmful to the health and well-being of Chinese women and children. It primarily is a summary and review of studies of Chinese women living in mainland China, but also includes a limited number of studies of Chinese women in Singapore, Hong Kong and Taiwan. Many of the studies are in Chinese and available only as an English abstract.

Short Term Physical and Psychological Complications

The Family Planning Institute, Chengdu, China studied 4000 women in Sichuan province who underwent an early abortion between July 1, 1990-June 30, 1991. The mean age of the women was 25 years, 88.6% were married and most (77.4%) worked as farmers. Women had a mean number of 1.57 births. Some 33.6% had one prior abortion, 52.1% had two or more prior abortions and only 14.3% had prior pregnancies but no prior abortions. All abortions occurred during the first trimester with 5.5% at less than 40 days gestation, 69.5% at 40-59 days gestation, and 25.0% at 60-90 days gestation. The abortion procedures used were vacuum aspiration (47.8%), vacuum aspiration and curettage (3.7%) and curettage (48.3%). Abortions were performed either by a graduate from a medical college (13.5%), a medical vocational school graduate (26.4%), or by those who had completed a family planning technique training program (56.9%).

Data on short term physical complications was sketchy. Blood loss during the abortion was reported to be in excess of 200 ml in 1.0% of the women. Bleeding at 15 days postabortion in excess of the normal amount of bleeding during menses was reported to be 0.7%. Fever (undefined) at 15 days postabortion was reported to be in 3.48% of the women. No retained tissue, cervical or uterine perforations were reported. It is likely that there were initially either incomplete abortions or failed abortions because of the use of both vacuum aspiration and curettage in 3.7% of the cases. There was no indication whether or not any pain medication or antibiotics were administered.

A psychological assessment was made both before and after the abortion at 15 days, 90 days and 180 days postabortion. A CES-D scale was used to assess 20 possible symptoms of depression during the past week. In addition, a SCL-90 test, consisting of 90 items, was used to measure the seriousness of psychological distress. Higher preabortion scores compared to postabortion scores were found on both tests which the authors believed reflected both the stress of the pregnancy and the impending abortion. Two days prior to the abortion 36.4% of the women mentioned an absence of positive affect. The main indicators of depression prior to the abortion on 3-4 days during the past week were: absence of good (7.5%); absence of hopeful (9.7%); absence of happy (10.7%); absence of enjoy (8.5%); poor appetite (12.8%); and effort (4.5%).

Occupation, education, age, number of previous abortions, number of previous pregnancies, the woman’s feeling when learning of this pregnancy, reasons for obtaining the abortion, and the operators training and education, were significantly associated with total CES-D scores. Women with higher depression scores tended to be non-farmers, had more education, were unhappy when learning of this
pregnancy, had no child, had a health problem, or were unmarried.

The responses of 28.75% of the women indicated an absence of affect 180 days after the abortion. The main indicators of depression reported 180 days after the abortion for 3-4 days during the past week were: absence of good (5.1%); absence of hopeful (8.5%); absence of happy (8.4%); absence of enjoy (5.8%); poor appetite (0.7%); and effort (0.3%). Better educated women, with more intellectual occupations, appeared to be more troubled and show some psychological distress 180 days after the abortion. The reported drop-out rate was low with 3948 women (98.7%) of the 4000 women still participating at 180 days postabortion.1

The Effect of Reproductive Outcomes on Marriage

Little is known about the impact of induced abortion or other reproductive events on the marriage of Chinese couples. In one study by researchers at the National University of Singapore, Chinese women in Singapore who were antenatal patients carrying to term were compared to women who were undergoing induced abortions for the first time, and women who had one or more prior abortions and were repeating abortion. It was found that women undergoing abortion had started their courting and sexual activities earlier than women carrying to term. Women who were carrying to term were more likely to be married (97.5%) and less likely to be divorced (2.5%) compared to women undergoing a first time abortion (78.5% married, 3.5% divorced) or those repeating abortion (88.5% married, 6.5% divorced). Women carrying to term were also significantly more likely to report their marriage relationship was good (54.5%) and less likely to report that it was poor (12.5%) compared to women aborting for the first time (33.5% good, 14.5% poor) or women repeating abortion (23.5% good, 23.0% poor). Women carrying to term were more likely to say they were not working (85%) compared to women aborting for the first time (64%) or women repeating abortion (70%). Despite the greater number of women who had abortions who were working, only 3%-5% said they had abortions for financial reasons.2 The perception by women of a deteriorating quality of the marriage relationship as the number of abortions increased was also found in an earlier study of Hungarian married women.3

Infertility has also been identified as creating psychological burdens among Chinese married couples. In a study of 652 women and 425 of their husbands at Peking Union Medical College who came to the infertility clinic for consultation and treatment during 1991-1992, more than 80% of the couples reported psychological stresses caused by infertility. People living in rural areas and those with lower level education were more adversely impacted by infertility. It was also found to affect a couple’s sexual and marital relationships.4

The birth of a daughter instead of a son can have an adverse impact on a marriage. One small study of young married women aged 20-30 in a rural area of China whose first child had been a girl found that 81% of the mothers were unhappy about giving birth to a girl. All of the husbands were reported to be depressed about it and constantly complained; 60% of the husbands acted in a cold and unfriendly manner to their wives; 55% of the husbands were verbally abusive; 30% beat their wives, and 28% of the husbands wanted a divorce.5

An example from a psychiatric interview of a married Chinese woman with a history of two abortions has also been reported. In this instance, a woman identified as Mrs. Lu had been married for four years and had one daughter. A son had died three hours after birth and she was persuaded to have two other pregnancies aborted. She was interviewed on her third visit to the psychiatric clinic. She said she has not felt well since she married, has had a headache for two years, suffered from insomnia, had no strength, vomited on waking every day, and that her hands and feet felt very hot. She said she kept losing her temper. The marriage had been arranged by their parents and she was dissatisfied with her new family. Both Mr. and Mrs. Lu believed in spirits and ghosts, and at least partly attributed her problems to spirit possession. They had consulted a shaman ten times.

Mrs. Lu said she has had positive feelings for her husband during the last 18 months and now loves him very much but that he has taken a job as a building laborer in town and can come home for only two weeks in every three months. She was diagnosed by a psychiatrist as having mild depression and traditional Chinese herbs were prescribed to help her sleep and improve her appetite. The author (a social worker) concluded that her life circumstances should have been taken into account and that an arranged marriage, abortions, in-law problems, an enforced nurturing role, lack of social support, a one-child policy, and a ‘socialist market economy’ where profit outweighs all other considerations, all took their toll on her.6

Maternal Mortality-Generally

According to a large epidemiological study, the average maternal mortality rate in China during 1989-1991 was 80 per 100,000 live births. Maternal mortality was reported to be lower in cities such as Shanghai and higher in underdeveloped rural areas.7
There is evidence that the official maternal mortality statistics are considerably under-reported in China. One study reported that maternal mortality may vary according to whether or not the pregnancy was "planned" which is defined by the government for women with no prior birth, or "unplanned" which is defined by the government for women who already have one child. According to a study of pregnancy-related deaths conducted by the Sichuan Health Department, 456 pregnancy-related deaths were identified during 1989-1991. Of these deaths, 466 (58%) occurred among women with "planned" pregnancies, while 190 occurred among women with "unplanned" pregnancies. The maternal mortality ratio for "planned" births was 78.9 deaths per 100,000 live births compared to 135.6 deaths per 100,000 live births for "unplanned" pregnancies. According to the authors of the study only the deaths from "planned" pregnancies are counted in official statistics because deaths of women from "unplanned" pregnancies are "unprovable". In addition, deaths from induced abortion are not counted as maternal deaths although there is evidence that they do occur.

Maternal Death from Postpartum and Obstetric Hemorrhage

There is considerable evidence that use of induced abortion to carry out the population control policies of China has a high cost of morbidity and mortality for Chinese women and children. One important aspect is the role of induced abortion in maternal mortality due to postpartum and obstetric hemorrhage at the time of subsequent childbirth. A retrospective case-control study was undertaken of Chinese women who delivered at a university teaching hospital in Hong Kong during 1985-1989. The study group was composed of 285 women who gave a history of two or more induced abortions and no other pregnancies prior to the index pregnancy. The control group consisted of an equal number of primigravidas with a single pregnancy, and no induced abortions, matched for age and date of delivery. There were a total of 661 prior induced abortions in the study group of which 39% were performed in the neighboring Shum Chum region of China. Some 82% of the induced abortions were performed in the first trimester of pregnancy and 4% in the second trimester and information on the trimester was not available in 14.7% of the abortions. Abortion technique was infrequently noted by the women but the authors stated that most first trimester abortions in Hong Kong and China are performed by suction evacuation.

Another study of risk factors for postpartum hemorrhage (PPH) was undertaken in Suizhou, in Hubei province in 1990-1991. It was found that women with a blood loss of more than 500 ml. were more likely to have long second and third states of labor and were more likely to have had prior abortion compared to women whose blood loss at delivery was less than 200 ml. In another study of 933 Chinese women in Sichuan and Ningxia provinces found that PPH was significantly increased due to placental factors which were related to a history of induced abortion. An Australian study and a British study also found

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Third stage complications in vaginal delivery were compared among women with two or more induced abortions, among women with more than three previous induced abortions, and the control group. Retained placenta was found in 2.9% of the women with 3 or less induced abortions, 7.0% of the women with more than three induced abortions, and 0.4% of the control group of women with only one pregnancy and no prior abortions. Primary postpartum hemorrhage (PPH) was found in 1.6% of the women with two or more induced abortions, in 3.5% of the women with more than three abortions, and 0.8% of the control group. (Table 1) The authors found no statistically significant differences in the incidence of hypertension, antepartum hemorrhage, diabetes mellitus, threatened abortion, low birth weight, or babies who were small for expected dates of delivery.
that retained placenta substantially increased the risk of postpartum hemorrhage. A large British study found that retained placenta increased the risk of major obstetric hemorrhage (1000 ml blood loss or more) by 13 fold. Blood loss of this magnitude may lead to maternal death as a result.  

Postpartum hemorrhage has been found in several studies to be the major cause of maternal mortality among Chinese women. Other Chinese studies have reported obstetric hemorrhage to be a major cause of maternal mortality in China. The high incidence of induced abortion in China, including repeat abortions, and various studies finding a positive correlation between induced abortion and the leading risk factors for maternal death, makes it most likely that induced abortion is an important factor contributing to maternal mortality in China.

**Maternal Mortality and Morbidity from Infections**

Reproductive tract infections have been increasingly recognized to be an important aspect of maternal and infant morbidity and mortality both in developing nations and, to a lesser degree, in developed nations. Untreated reproductive tract infections can lead to pelvic inflammatory disease, ectopic pregnancy, infertility, fetal loss, cervical cancer, increased risk of HIV transmission. Frequently, these infections have no discernible symptoms and remain undiagnosed, unreported and uncounted. A recent Chinese study of reproductive tract infections in rural Yunnan Province also found that self-reported symptoms and clinical examination was inadequate in the diagnosis of trachomonas, candida, bacterial vaginosis, gonorrhea, and chlamydia.

Chinese studies have found that induced abortion is a risk factor for increased incidence of several types of sexually transmitted diseases. Genital mycoplasma hominis infection in women was investigated at Xiaguian District, Nanjin, China, in June, 1990 by testing the vaginal discharge of 722 women for the antigen of mycoplasma hominis. Women who were pregnant three or more times had a statistically significant higher infection rate. The researchers suggested that induced abortion might provide the opportunity for the infection. The prevalence of m. hominis was found to be significantly lower in the group of women where contraceptive condoms were used and higher in the group of women using an intrauterine device. Another study of Chinese women in Yunnan Province found that the antibody positive rate was 46% for mycoplasma infection in the postabortion group which was significantly higher than women who were infertile or fertile (26.1%) or women using an IUD (32.4%). (Table 2) The authors suggested that mycoplasma infection is one of the important causes for infertility and complication of genital inflammatory symptoms after abortion.

A study of 2287 married women of reproductive ages from Luliang county in Yunnan province found an overall prevalence of vaginitis of 10.2%. Among the main risk factors for vaginitis was number of induced abortions. Other main risk factors were age, occupation, age of marriage, numbers of pregnancies, numbers of natural abortions, numbers of stillbirths, numbers of failed pregnancies, contraceptive methods, intercourse per month, and washing lower body with dirty water during menses. In a cervical screening carried out in Jingan, China from 1974 to 1985 it was found that the incidence of trichomonas vaginalis significantly increased with an increasing number of induced abortions.

Other studies in Western countries have also found that the incidence of chlamydia trachomatis, intraamniotic infection, and neonatal sepsis are significantly higher in postabortion women compared to women with other reproductive outcomes. It also has been established that the presence of bacteria or viruses such as chlamydia trachomatis or gonorrhea at the time of an induced abortion greatly increases the likelihood of postabortion infections such as endometritis (inflammation of the uterus wall) or pelvic inflammatory disease (PID), which is a major cause of infertility. It is believed that this is due to the spread of infection into other areas of the genital tract by insertion of instruments at the time of abortion.

The incidence of sexually transmitted diseases among Chinese women has increased rapidly in recent years. One epidemiological study in selected areas of China found that STD's increased from 26 per 100,000 in 1987 to 104.8 per 100,000 in 1993. N. gonorrhea was the most common, but chlamydia trachomatis infections, an important cause of urethritis, cervicitis and PID were also found to be common,
causing the government to take steps to control STD's.²⁷ Frequently, the same person will have more than one STD.²⁸ In addition, there is evidence of increasing resistance of STDs to antibiotics.²⁹ Induced abortion contributes to this serious problem.

**Infant Morbidity and Mortality from Infections**

Postabortion infections not only result in increased maternal morbidity and mortality, but also increase the likelihood of infant mortality or birth defects. For example, neonatal sepsis, although having a relatively low incidence in the U.S. of one to ten cases per 1000 live births, has a high case fatality rate of 50-75%. It is also frequently complicated by meningitis with surviving children having neurological defects.³⁰ The incidence of neonatal sepsis has been reported to be much higher in developing countries. This is attributable not only to maternal infections but also other factors such as low birthweight, premature delivery, prolonged and complicated delivery and drug resistance to certain infectious organisms.³¹ A Chinese study reported that the existence of congenital defects in newborns is statistically related to infection in the first trimester of pregnancy.³²

A later U.S. study found that when maternal infection is present, surviving children are much more likely to have cerebral palsy, even in the absence of low birth weight.³³ A Chinese study found that endometritis in women after childbirth was much higher (28.6%) where mothers had chlamydia trachomatis (CT) compared to those mothers who were CT negative (8.1%). Neonatal conjunctivitis and pneumonia was also much higher in the infants whose mothers were CT positive (45% and 30% respectively) compared to infants whose mothers were CT negative (18.3% and 8.3% respectively). The authors stated that perinatal infection caused by chlamydia trachomatis is very common in China.³⁴

**Gestational Trophoblastic Neoplasia**

Gestational trophoblastic neoplasia includes complete hydatidiform mole, invasive mole and choriocarcinoma. These occur due to defective fertilization of the sperm and egg. Choriocarcinoma is malignant and therefore is considered a form of cancer. A 1978 report from a U.S. Cancer Delegation to China stated that trophoblastic neoplasia occurs excessively throughout China.³⁵ A subsequent case-control study was begun in 1984 of Chinese women with complete hydatidiform mole. It was found that a history of a term birth was associated with a statistically significant reduced risk of 0.6, while a history of one induced abortion had a nonsignificant increased risk of 1.2, and a history of two or more induced abortions had a statistically significant increased risk of 2.8 compared to women with no history of induced abortion.³⁶ (Table 3) The reported incidence of hydatidiform mole in a 1981 Chinese study was 6.67 per 1000 pregnancies. This is a considerably higher incidence compared to countries such as the U.S. (1.08) or Italy (0.62).³⁷ Gestational trophoblastic neoplasia is life-threatening. One Chinese hospital reported that the incidence of mortality for choriocarcinoma was 32.7% after treatment and 8.1% for invasive mole after treatment.³⁸ A larger hospital study conducted in China during 1983-1993 found that women with gynecologic malignant tumors frequently did not receive proper treatment with cases of choriocarcinoma and invasive mole not receiving enough chemotherapy in 38% of the cases.³⁹ It is estimated that about 8000 women in China die from choriocarcinoma each year.

Other studies in Western nations have also found that induced abortion is a risk factor for gestational trophoblastic neoplasia, including molar pregnancy and choriocarcinoma, especially if the preceding pregnancy resulted in an induced abortion.⁴⁰

**Pre-term Delivery / Infant Growth Retardation**

A case-control study of pre-term delivery was undertaken at the district of Qiaokou in Wuhan province from October, 1987 to May, 1988. The study population consisted of mothers of singleton term infants. Logistic regression analysis showed that a significant factor for preterm delivery was a previous induced abortion. Other
significant factors were low maternal stature, young age at menarche, a history of infertility problems, vaginal bleeding during pregnancy, low weight gain during the pregnancy, premature rupture of membranes, excessive vomiting during pregnancy, and lack of antenatal care. Also, the study found that psychosocial stress in pregnancy might be related to preterm delivery.41

A community-based prospective study was conducted in Chongqing, China from November 1995 to June 1996 in which 101 infants were examined at 12 and 15 months for evidence of early linear growth retardation. Written informed consent was obtained from a parent of each infant before the first examination. Previous abortion was found to be common and was associated with impaired growth including both short stature and stunting as measured by change of length and length velocity. An approximate two-fold risk was found for infant stunting during 12-15 months of life if the mother had a multiple abortion history. The researchers stated that "together with its significance for short stature, a mother's abortion history may have both a short-term and long term effect on a baby's growth." 42

Reproductive History and Cancer Risk

Breast Cancer

In a case-control study of 534 histologically confirmed cases of breast cancer in Chinese women in Shanghai compared to an equal number of age and sex-matched population controls, early age at menarche was positively associated with breast cancer. In contrast, early age at first full term pregnancy, high parity, and long duration of nursing were each negatively associated with breast cancer. Other risk factors for breast cancer included high average body weight especially among women over age 60, use of oral contraceptives after age 45, personal history of benign breast disease, and history of breast cancer in first degree female relatives. Multivariate analysis showed that each of these risk or protective factors was independently related to breast cancer.43 Similar results were also found in a Taiwanese study.44 The incidence of breast cancer among women in Shanghai has been increasing. During 1972-74 the reported incidence was 18.3 per 100,000 women. In 1990, the reported incidence was 28.5 per 100,000 women. Among the stated reasons for an increase were late first newborn and sparsity of giving birth.45

A case-control study of breast cancer in Harbin, China during 1990-1992 among women younger than 45 years of age found a statistically significant increased risk of 2.9 for women who had experienced an induced abortion relative to women without an induced abortion, and an increased risk of 3.6 for women with two or more induced abortions compared to women without an induced abortion. The increased risk was somewhat higher among women diagnosed for breast cancer at age 35 or less compared to older women.46 (Table 4)

Ovarian Cancer

A case-control study in Beijing, China by researchers at Peking Union Medical College compared 112 pathologically confirmed epithelial ovarian cancer cases with 224 community matched controls. It was found that compared to nulliparous women, subjects with one, two, or three full-term pregnancies were at 50%, 70% and 90% reduced risk for epithelial ovarian cancer, respectively.46 The findings of this study are consistent with various Western studies which have also found that childbirth is protective against ovarian cancer compared to nulliparous women.46

Cervical Dysplasia

Researchers at the National Taiwan University conducted a questionnaire survey of 17,047 women who lived in the Taipei metropolitan area of Taiwan and who attended an area family planning service in 1991-1992. The survey included reproductive history and Pap smear history. Some 46% of the women had a history of having had an induced abortion with 54.8% of these women with one abortion, 29.7% with two abortions and 15.5% with three or more abortions. Some 55% of the women had a normal Pap smear, 44% had an atypical finding, and 0.9% had dysplasia. The odds ratio for dysplasia significantly increased with the number of prior induced abortions from 17%, 34% and 60% with one, two and three or more prior induced

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<th>Table 4. Induced Abortion as a Risk Factor for Breast Cancer, Harbin, China, 1990-1992</th>
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<td>Relative Risk and 95% confidence Interval</td>
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abortion rates respectively, compared to women with no prior induced abortion. The authors concluded that induced abortion has harmful effects on maternal health.49

**Poor quality cancer treatment**

The quality of treatment for recurrence, persistence or death from various gynecologic malignant tumors was studied in 61 Chinese hospitals between 1983-1993. It was found that pathological grading was not performed in 56.52% of the cases. In malignant tumors requiring surgical treatment, inappropriate operations were performed for 81.68% of ovarian carcinomas, 64.38% of cervical carcinoma, and 70.08% of women with endometrial cancer. Insufficient chemotherapy was found in 55.47% of ovarian cancer cases and 38.31% of cases of choriocarcinoma and malignant mole. Insufficient dosages of radiotherapy were found in 54.90% of cases of cervical cancer.50

**Potential Increased Risk for Lung Cancer/ Coronary Heart Disease**

Two studies reported considerably higher smoking rates among women in Hong Kong with a history of one or more induced abortions compared to women with no abortion history. In a case-control study conducted at a university teaching hospital in Hong Kong between 1985 and 1989, among Chinese women with a history of two or more induced abortions who delivered, 13.0% were smokers compared to only 1.4% smokers among women with no abortion history who delivered.51 In another Hong Kong hospital-based study during 1993-1996, 39% of teenage mothers (age 13-19) with a history of induced abortion who delivered were smokers compared to 14.4% smokers among teenage mothers who delivered but had no induced abortion history.52

The higher incidence of smoking among Chinese postabortion women compared to women with other pregnancy outcomes is consistent with U.S. and European studies. It has also been shown that women seeking abortion do not reduce their smoking while women intending to deliver will reduce smoking. Also, post-abortion anxiety has been correlated with increased incidence of smoking as well as the number of cigarettes smoked. Although far fewer Chinese women smoke compared to Chinese men, one recent study of smoking among males and females in Shanghai found that among women who smoke the tobacco attributable risks of lung cancer and respiratory disease are about the same for men.50 A recent review of studies on smoking and heart disease in China and Hong Kong found that the relative risk for coronary heart disease among women who smoked compared to women who did not smoke was 2.5 to 3.5 although the 95% confidence interval was wide.54

**Conclusions**

Based upon the available studies, induced abortion by Chinese women is harmful to the psychological and physical health of Chinese women in several respects. There are substantial adverse psychological and relational effects. It increases the incidence of maternal mortality due to postpartum and obstetric hemorrhage. It increases morbidity and mortality in women from infections as well as increasing the incidence of gestational trophoblastic disease. Induced abortion also limits the protective effects of childbirth from cancer and instead increases the risk of cancer. There is evidence that it may contribute to lung cancer and heart disease in women from increased incidence of smoking. There is evidence that
References

1. A Follow-up Study of First Trimester Induced Abortions at Hospitals and Family Planning Clinics in Sichuan Province, China, L Luo et al, Contraception 53:267, 1996
4. Psychological aspects of infertile couples in China, L Xu et al, Chung Hua Fu Chan Ko Tsa Chih 29(4):232, April, 1994 (English Abstract)
5. A probe into the mentality of sixty-five rural young women giving birth to baby girls, JH Zhou, China Social Anthropol. 93, Spring, 1988
20. Epidemiologic investigation of genital mycoplasma hominis infection in women, H Li, Chung Hua Liu Hsing Ping Hsueh Tsai Chih 13(2):82, April, 1992 (English Abstract)
21. Serological survey on mycoplasma infection among three populations in Yunnan Province, HY Yang et al, Chung Hua Liu Hsing Ping Hsueh Tsai Chih 17(2):91, April, 1996 (English Abstract)
22. Study on risk factors of vaginitis in married women at reproductive ages in rural areas Luliang County, Yunnan Province, JH Luo et al, Chung Hua Liu Hsing Ping Hsueh Tsai Chih 16(1):14, Feb 1995 (English Abstract)
28. Investigations on the present status of infections with Chlamydia trachomatis, Mycoplasma hominis and ureaplasma urealyticum, R Jaing and Z Zhang, Chung Hua Liu Hsing Ping Hsueh Tsai Chih 15(2):87, April, 1994 (English Abstract)
30. Reproductive History and the Risk of Neonatal Sepsis, M Germain et al, Paediatric and Perinatal Epidemiology 9:48, 1995
32. A prospective study on the relationship between abnormal pregnancy outcome and Toxoplasma gondii infection, Z Zhao, Chung Hua Liu Hsing Ping Hsueh Tsai Chih 13(3):54, June, 1992 (English Abstract)
34. Study on the perinatal infection caused by Chlamydia trachomatis, L Shen et al, Chung Hua Fu Chan Ko Tsa Chih 30(12):714, Dec,1995 (English Abstract)
39. Persistent and recurrent gynecologic malignant tumor treated within one year: analysis of 1753 cases from 61 hospitals in China Z Cao and S Yu, Chung Hua Fu Chan Ko Tsa Chih 31(7):417, 1996 (English Abstract)
41. Study of factors associated with preterm delivery, YJ Li and YS Zhou, Chung Hua Liu Hsing Ping Hsueh Tsai Chih 11(4): 229, August.1990 (English Abstract)
42. Early pregnancy growth retardation in Chongqing, China, YX Liu et al, J Paediatric Child Health 5(3):272, June,1999
43. Risk factors for breast cancer in Chinese women in Shanghai, YM Yuan et al, Cancer Research 48(7):1949, April, 1988,
49. Induced abortion in Taiwan, DP Wang and RS Lin, J Royal Soc Health 105-108, April,1995
50. Persistent and recurrent gynecologic malignant tumor treated within one year: analysis of 1753 cases from 61 hospitals in China, Z Cao and S Yu, Chung Hua Fu Chan Ko Tsa Chih 31(7):417, 1996 (English Abstract)
52. Induced abortion is not a cause of subsequent preterm delivery in teenage pregnancies, TT Lao and LF Ho, Human Reproduction 13(3):758,1998
54. A review on studies of smoking and coronary heart disease in China and Hong Kong, HE Yao and Lam Tai Hing, Chinese Medical Journal 112(1):3, 1999