Oncofertility in Poland: Science, Religion, and Health after Communism

The vast political changes that occurred in Poland over the past two decades have advanced, among other things, the liberty of its people to make informed choices about the medical technologies available to them. Despite their availability, assisted reproductive technologies (ARTs) are underused by Polish women. Researchers at Northwestern University’s Feinberg School of Medicine have developed a novel ART, ovarian cryopreservation and follicle maturation, aimed at preserving fertility among young female cancer survivors. My study seeks to explore the possible political, religious, and psychological reasons behind Polish women’s current underuse of ARTs and whether such factors would also apply to the use of ovarian cryopreservation and follicle maturation.

For eight weeks, I plan to survey female patients in both rural and urban gynecological clinics in southern Poland about their opinions on infertility treatments as well as their religiosity, personal experiences with cancer and fertility, and relevant socioeconomic factors. Additionally, I will interview physicians about current practices regarding patients, especially female cancer patients, and fertility. The findings will have implications for public health policy in Poland and potentially other Eastern European countries. It is my hope that a better understanding of women’s views on ARTs will contribute to more effective education of the public and of physicians as well as higher quality patient care.

Poland is a country with a complicated, often turbulent political history, but a largely homogenous population—genetically, ethnically, and religiously. The population is nearly 98% Caucasian and 90% Roman Catholic, according to the 2002 Census (CIA). The Catholic Church believes that life begins at conception, and that infertility treatments such as in vitro fertilization (IVF) violate the sacred rights of human life. Based on conversations with a Catholic gynecologist in Poland, it is my expectation that the women in more rural areas who tend to be more devoutly religious will have opinions very much in keeping with Church teachings, whereas women in more urban areas will be more open to the idea of ARTs. I hypothesize that younger, better educated women will also have more positive attitudes towards ARTs. Women who have had personal experiences with cancer may have more favorable views of ARTs specifically geared towards cancer patients.

In a 1996 study of couples in five European countries, Polish couples were least likely to seek medical help after being unable to conceive for six months, twelve months, and over twelve months (Olsen 98). According to a 2003 study, 20% of Polish couples are infertile (unable to conceive after twelve months of unprotected sex) and birth rates have been on the decline in the past several decades (Sanocka 18). A two year study of INTERMEDICA Clinic of Infertility in Poznan, Poland revealed a pregnancy rate of 38.9% for IVF and a rate of 33.8% for intracytoplasmic sperm injection (ICSI) (Kaczmarek 125). These pregnancy rates are close to the rates of pregnancy from ARTs
of all of the ARTs reported to the Centers for Disease Control and Prevention (CDC) in 2000, 37% resulted in pregnancy (“Assisted”).

Breast cancer is the most common cancer among women in Poland and in the European Union (EU) in general (Syczewska-Weber 657). Both incidence and mortality rates of breast cancer rates are lower in Poland than they are in the EU (657). In the case of uterine cancer, however, incidence and mortality rates are significantly higher in Poland than they are in the EU (657). It appears that between 2002 and 2006 the incidence of uterine cancer has increased while the mortality rate has remained nearly the same (657). This finding suggests that these cancers are being detected earlier and that more women are surviving. As more women survive their cancers, more are experiencing the effects of chemotherapy and other treatments on their fertility.

There is evidence that infertility is a problem for a substantial amount of couples in Poland. As more women survive cancer, this number is likely to get higher. Further, it seems that ARTs as successful as in the United States are available in Poland. However, ARTs continue to be underused in Poland.

In my research I want to find out why ARTs are underused in Poland. I anticipate that religion, economics, level of education, and perhaps the policies of the health care system and of individual physicians may play a role.

I plan to interview female patients of gynecological clinics in three major locations in Poland--Mszana Dolna (a small town), Myslenice (a larger town), and potentially Krakow (a large city). I plan on surveying somewhere on the order of three hundred patients during an eight week period. The surveys will be comprised of multiple choice questions, scale questions (e.g. to what extent do you agree with the Catholic Church’s teaching on contraception? very much, somewhat, not at all), and questions in response to a scenario. The scenarios will involve the case of a patient considering using an ART and subsequent questions will assess the subjects’ opinions on what the patient should do and the morality of the choices. Additionally, I will conduct interviews with the gynecologists at these clinics, approximately three interviews. I will seek to find out how often patients ask them about ARTs, how often they recommend ARTs to patients (especially cancer patients), and their personal opinions on ARTs. The purpose of the interviews is not to provide a representative sample of Polish physicians, but rather to provide the perspective of the physicians treating the patients that will be surveyed.

I have taken several relevant courses relating to Global Health: Achieving Global Impact through Local Engagement, Managing Global Health Challenges, and Medical Sociology. In these courses I learned about health care systems and the economics of health care in both the U.S. and in other countries. Additionally, I have learned about various situations in which the experience of a person with the same disease varies significantly both within countries and from country to country. This past quarter I have taken a Supervised Research course on Oncofertility where I have been doing background research on this specific project, that is cancer and fertility among Polish women. Additionally I have taken both Statistics for Psychology and Research Methods in Psychology where I designed research projects, analyzed the relevant statistics using SPSS, and wrote research papers. Further, I am a native Polish speaker. For the past two years I have been volunteering regularly as a Polish Interpreter at Community Health Clinic in Chicago, where I have interacted with Polish patients in a health care
setting. I have also completed the IRB training and have submitted my project for human subjects research clearance.

The Supervised Research course on Oncofertility in which I am currently enrolled is designed to be a two-quarter course. I intend to spend fall quarter of next year using my research this summer to create an independent study project as a part of this course. I would like to submit the final project for publication in a scholarly journal. I am taking a year off before medical school and would like to apply for a Fulbright Scholarship in which I would continue and extend my research of ART use in Poland.

Appendix 1A: Survey in English

Please answer the following questions as accurately and completely as you can. All answers will be kept confidential.

1.) Age:

2.) What town do you live in?

3.) What religion do you identify with?
   a) Roman Catholic
   b) Judaism
   c) Protestant
   d) Other ______________

4.) How often do you attend your place of worship? (Please circle the answer that best describes you.)
   a) everyday
   b) once a week (and holy days of obligation)
   c) once a month
   d) holidays

5.) Please rate the extent to which you agree with the following statements:
a) Abortion is morally wrong.  
very much  somewhat  not at all  
b) Abortion should be illegal.  
very much  somewhat  not at all  
c) Contraception (condoms, birth control pills, etc.) is morally wrong.  
very much  somewhat  not at all  
d) Contraception (condoms, birth control pills, etc.) should be illegal.  
very much  somewhat  not at all  
e) In vitro fertilization is morally wrong.  
very much  somewhat  not at all  
f) In vitro fertilization should be illegal.  
very much  somewhat  not at all  
g) In vitro fertilization is very expensive. Even if I did want to use it, I would be worried that I could not afford it.  
very much  somewhat  not at all  
6.) Do you have children?  yes  no  
If so, how many boys?  
How many girls?  
7.) Have you ever been diagnosed with cancer?  yes  no  
If so, what type?  
What, if any, impact did it have on your fertility?
8.) Have you ever had a loved one (or loved ones) diagnosed with cancer?  yes  no

   If so, what type(s)?

   What, if any impact did it have on their fertility?

9.) Please circle the highest level of education that you have completed.

    Elementary School
    Middle School
    High School
    Vocational Training
    Bachelor’s Degree
    Master’s Degree
    Medical Degree or PhD.

10.) The following is a series of facts related to assisted reproductive technologies (ARTs) and to cancer treatment. Some of the statements are true and some are false. Please circle whether you think the statement is true or false. Do not worry if you are not sure of every answer, some are very specific scientific statements.

a) The risk of having multiple births when using in vitro fertilization is higher than it is with a natural pregnancy.  True  False

b) The risk of a premature birth is higher when using in vitro fertilization than it is with a natural pregnancy.  True  False
c) The risk of birth or genetic defects is higher when using in vitro fertilization than it is with a natural pregnancy.  True  False

d) Chemotherapy and radiation may cause an earlier onset of menopause.  True  False

e) Chemotherapy and radiation may cause infertility.  True  False

11.) The following is a scenario where a mother must make a medical decision for her daughter. Please read the scenario carefully and answer the questions based on how you think you would respond if in the same situation.

Mary is twelve years old. She has been diagnosed with leukemia, but it has been detected early and the doctors say that her prognosis is very good. However, she will have to undergo chemotherapy which may cause her to be infertile. She is of course, too young to undergo in vitro fertilization. There is, however, a new fertility technique that has been developed in the United States that is specifically for young female cancer patients. The technique has been used successfully on patients for two years. The technique is called ovarian cryopreservation. Before undergoing chemotherapy or radiation, the ovary is removed and frozen until the woman wishes to become pregnant. When she does wish to become pregnant, a follicle (the egg with all the cells that feed it and help it survive) from her ovary will be matured in the laboratory. The egg will be fertilized with her partner’s sperm and implanted into the woman.

a) As Mary’s mother, would you want for her to undergo the procedure to preserve her ovary?
definitely  maybe  absolutely not  not sure

b) Please briefly explain your answer.

Thank you so much for your time. Your answers will help doctors and researchers have a better understanding of how women in Poland view fertility and fertility treatments. If you have any questions, please ask Katarzyna (Kasia) Kadela or email her at k-kadela@northwestern.edu.

Appendix 1B: Survey in Polish

Proszę odpowiedzieć na następujące pytania. Wszystkie odpowiedzi są anonimowe.

1.) Wiek:
2.) W jakiej miejscowości pani mieszka?
3.) Czy jest pani osoba wierząca?
   a) tak
   b) nie
   Jaka religie pani wyznaje?
4.) Jak często uczeszcza pani do kościoła?
   a) codziennie
   b) raz w tygodniu (w dni obowiązkowe)
   c) raz na miesiąc
   d) od świąta

5.) Proszę zakreślić do jakiego stopnia zgadza się pani z następującymi zdaniami.

Aborcja jest niemoralna.
   zgadzam się kompletnie    nie mam zdania    nie zgadzam się

Aborcja powinna być nielegalna.
   zgadzam się kompletnie    nie mam zdania    niez zgadzam się

Antykoncepcja (zapobieganie ciąży, pigulki antykoncepcyjne, etc.) jest nie moralna.
   zgadzam się kompletnie    nie mam zdania    nie zgadzam się

Antykoncepcja (zapobieganie ciąży, pigulki antykoncepcyjne, etc.) powinna być
nielegalna.
   zgadzam się kompletnie    nie mam zdania    nie zgadzam się

Zaplodnienie in vitro jest niemoralne.
   zgadzam się kompletnie    nie mam zdania    niez gadzam sie

Zaplodnienie in vitro powinno być nielegalne.
   zgadzam się kompletnie    nie mam zdania    nie zgadzam się

Zaplodnienie in vitro jest bardzo drogie. Nawet gdybym chciała sie go podjąć, nie wiem
czy było by mnie na to stać.
   zgadzam się kompletnie    nie mam zdania    nie zgadzam się
6.) Czy ma pani dzieci? tak nie
Jeżeli tak, to:
   Ile chłopców?
   Ile dziewczat?

7.) Czy była pani kiedykolwiek zdiagnozowana z choroba nowotworowa?
   tak nie
   Jeżeli tak, to jaki rodzaj choroby nowotworowej?
   Jaki, jeżeli w ogóle, choroba ta miała wpływ na pani płodność?

8.) Czy ktoras z bliskich pani osob była zdiagnozowana z choroba nowotworowa?
   tak nie
   Jeżeli tak, to z jakim rodzajem choroby nowotworowej?
   Jaki, jeżeli w ogóle, choroba ta miała wpływ na płodność tej osoby?

9.) Proszę zakreslic pani wykształcenie.
   Szkoła podstawowa
   Szkoła zawodowa
   Liceum lub technikum
   Tytul Magistra
   Tytul Doktora
10.) Ponizsze pytania dotycza sztucznych medod zapladniania oraz leczenia chorob nowotworych. Prosze zakreslic czy uwaza pani ponizsze zdania za prawdziwe, nieprawdziwe lub jesli nie ma pani zdania.

Ryzyko urodzenia wielu dzieci jest wyzsze w przypadku zaplodnieniu in vitro niz w przypadku naturalnej ciazy. Prawda Nie prawda
Ryzyko urodzenie dziecka przed terminem jest wyzsze w przypadku zaplodnienia in vitro niz w przypadku naturalniej ciazy. Prawda Nie prawda
Ryzyko wad wrodzonych lub genetycznych dziecka jest wyzsze w przypadku zaplodnienia in vitro niz w przypadku naturalnej ciazy. Prawda Nie prawda
Chemoterapia i naswietlanie moze powodowac wczesniejsza menopauze. Prawda Nie prawda
Chemoterapia i naswietlanie moze powodowac bezplodnosc. Prawda Nie prawda

11.) Ponizej podany jest przyklad gdzie matka musi podjac decyzje medyczna za swoja corke. Prosze dokładnie przeczytac podany przyklad i odpowiedziec jak pani zachowalaby sie w podobnej sytuacji.

Zjednoczonych ktora ma zastosowanie w przypadku mlodych pacjentek zdiagnozowanych z choroba nowotworowa. Ta technika leczenia jest z powodzeniem stosowana na pacjentkach od ponad dwoch lat. Technika ta znana jest pod nazwa przechownia jajnika przez zamrozenie. Przed podjeciem leczenia chemoterapia lub naswietlaniem, jajnik zostaje usuniety i zamrozony az do chwili kiedy kobieta bedzie mogla bezpiecznie zajsc w ciaze. Kiedy w przyszlosci zdecyduje sie na zajscie w ciaze, jej zachowane jajeczko w otoczeniu komorki macierzystej zostanie rozwinieta w laboratorium. Jajeczko w dalszej kolejnosci zostanie zaplodnione plemnikami przyszlego ojca i wszczepione spowrotem kobiecie. 

Czy jako matka Marysi chciałabys aby zdecydowała sie ona na powyzszy zabieg?

Zdecydowanie tak  
Byc moze tak  
Nie jestem pewna  
Zdecydowanie nie  

Proszę krotko uzasadnic swoja odpowiedz

Dziekuje bardzo za czas ktory poswiecila pani na wypełnienie tej ankiety.

Pani odpowiedzi pomoga lekarzom lepiej zrozumiec jakie jest podejscie kobiet do zagadnien zwiazanych z plodnoscia i jej leczeniem. Wszelkie pytania zwiazane z ankieta prosze kierowac do Katarzyny Kadeli na adres: k-kadela@northwestern.edu
Appendix 2A: Interview Questions for Gynecologists in English

1.) How often do your patients ask you about the availability of ARTs?

2.) How often and in what cases do you give your patients advice or information concerning ARTs?

3.) Do you have moral or religious opinion about in vitro fertilization that influences your practice with patients? If so, please explain.

4.) What do you tell patients undergoing chemotherapy or radiation as cancer treatments regarding the effects of these treatments on their fertility?

5.) Based your professional experience, how would you describe the availability and financial feasibility of ARTs to Polish women?

* I anticipate that logical follow up questions will ensue based on the answers given by the doctors.

Appendix 2B: Interview Questions for Gynecologists in Polish

1.) Jak czesto pacjentki pytaja pani o mozliwosci lub szczegoly techniczne zaplodnienia typu in-vitro?

2.) Jak czesto i w jakich przypadkach poleca Pani lub udziela informacji swoim pacjentkom na temat tej technologii zaplodnienia?

3.) Czy Pani moralne lub religijne poglady maja wpływ na pani zdanie o zaplodnieniu in-vitro i czy wpływa ona na stosowana praktyka lekarska. Jezeli tak, to prosze o krotkie wyjasnienie.

4.) Jakie sa Pani zalecenia lub porady dla pacjentek, ktere przechodza przez chemoterapię lub naswietlanie w leczeniu choroby nowotworowej - i ich wpływ na plodnosc kobiety?

5.) Na podstawie Pani doświadczenia zawodowego, jak opisala by Pani podejście lekarzy i pacjentow do zaplodnienia in-vitro ? Czy technika ta jest ogolnie dostepna?
Appendix 4A: Consent Form in English

Northwestern University
Global Health

CONSENT FORM

Project Title: Assisted Reproductive Technology Use in Poland

Student Investigator: Katarzyna Kadela
Faculty Advisor: Teresa Woodruff

Supported by: Northwestern University Summer Undergraduate Research Grant

Introduction/Purpose:
You are being asked to participate in a research study that seeks to determine opinions on fertility and treatments of infertility. You are being asked to participate in this study because we are interested in the opinions of Polish women on this topic. The purpose of this study is to better understand Polish women’s views on fertility and infertility treatments and why they hold these views. We will survey about 300 people for this study.

Procedures
As a participant in this study, you will be asked to complete a survey during your visit to the doctor. Your participation in this study will last approximately fifteen minutes.

At any time in the study, you may decide to withdraw from the study. If you withdraw no more information will be collected from you. When you indicate you wish to withdraw the investigator will ask if the questions already answered on your survey form can be used.

Risks
Your participation does not involve any risks other than what you would encounter in daily life. Some of the questions may be upsetting or you may be uncomfortable with some of the questions and topics we will ask about. If you are uncomfortable, you may decide not to answer the questions. If at anytime you wish to stop the survey, tell the researcher that you are not able to continue. You may stay in the study even if you skip some of the questions. You may withdraw at any time.

Benefits:

There may be no direct benefit to you by your participation in this research study. Your participation in this study may aid in our understanding of how women in Poland view assisted reproductive technologies and why.

If there is absolutely no benefit to the subject ‘may’ should be substituted with ‘will’.

If the research participation is a part of a class requirement the amount of credit or the alternative to credit should be explained here. The description should include what was approved in the IRB submission that covers subject pools for departments and sections.

Alternatives:

You have the alternative to choose not to participate in this research study.

Confidentiality:

Participation in this research study may result in a loss of privacy, since persons other than the investigator might view your study records. Unless required by law, only the study investigator, members of the investigator’s staff, the Northwestern University Institutional Review Board, and representatives from the Office of Human Research Protections (DHHS) will have authority to review your study records. They are required to maintain confidentiality regarding your identity.

Results of this study may be used for research or publication. The survey will not ask for your name, so you can only be identified as a patient of the gynecology clinic at which the survey will be taken.

Centralized data collection or registries:

The results of your examinations will be collected in a centralized computer or data registry at the Northwestern University in Evanston, Illinois. The results will be stored according to a code.
Financial Information:

Your participation in this study will involve no cost to you. You will not be paid for your participation in this study.

Subjects’ Rights:

Your participation in this study is voluntary and you are free to withdraw at any time. You are free to choose not to answer particular questions if you do not want to.

Contact Persons:

If the Research Related Injury section is required, this section is not necessary.

Any questions you may have about this study may be directed to Katarzyna Kadela at email k-kadela@northwestern.edu. Questions about your rights as a research subject may be directed to Katarzyna Kadela at telephone number k-kadela@northwestern.edu. If problems arise evenings or weekends, you may email k-kadela@northwestern.edu.

Consent:

I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and my questions have been answered. If I have additional questions, I have been told whom to contact. I agree to participate in the research study described above and will receive a copy of this consent form. I will receive a copy of this consent form after I sign it.

Subject’s Name (printed) and Signature  Date

Name (printed) and Signature of Person Obtaining Consent

Appendix 4B: Consent Form in Polish

Universytet Northwestern
Zgoda na przeprowadzenie ankiety:

Tytuł projektu: Wykorzystanie technik sztucznego zapłodnienia w Polsce

Student przeprowadzający ankiety: Katarzyna Kadela
Doradca techniczny projektu: Teresa Woodruff

Affiliowany przez [lub sponsorowany przez]: Letni Fundusz Badawczy
Universytetu Northwestern

Wstęp/zalozenie:

Została pani poproszona o wzięcie udziału w anonimowej ankiecie której celem jest zebranie opinii na temat płodności i leczenia niepłodności. Poproszono panią o wzięcie udziału w tych badaniach ponieważ jesteśmy zainteresowani jakie zdanie mają na ten temat kobiety w Polsce. Celem tych badań jest lepsze poznanie punktu widzenia kobiet w Polsce na zagadnienie płodności i leczenia niepłodności. Ankieta objętych zostanie około 300 kobiet.

Instrukcje

Ankieta zostanie przeprowadzona wśród osób - pacjentów podczas ich wizyty w gabinecie lekarskim.

Udział w ankiecie jest anonimowy i całkowicie dobrowolny. Z ankiety można wycofać się w każdej chwili. W takiej sytuacji prowadzący ankiety zapyta czy pytania na które do tej pory odpowiedziałas moga zostać wykorzystane w badaniach.

Ryzyko:

Twoj udział w ankiecie nie jest związany z żadnym ryzykiem. Nie musisz odpowiadać na pytania jeśli uważasz ze są one nieodpowiednie. Jeśli w jakimkolwiek momencie ankiety chcesz je przerwać - powiedź o tym prowadzającemu. Nie musisz - jeśli nie chcesz - odpowiadać na wszystkie pytania zawarte w ankiecie. W każdej chwili możesz wycofać się z ankiety.

Korzyści:
Mozesz nie odniesć bezpośrednich korzyści z wypełniania tej ankiety. Twoj udział w ankiecie pomoże w lepszym zrozumieniu opinii kobiet w Polsce na temat sztucznych metod zapłodniania.

Wybor:

Twoj udział w ankiecie jest dobrowolny. W każdej chwili możesz zrezygnować z udziału w ankiecie.

Poufność:

Ankieta jest anonimowa. Jej wyniki mogą zostać użyte w badaniach i publikacjach. Inne niż ankietująca osoby mogą korzystać z wyników ankiety. Tylko z nakazu prawa mogą to być osoby nie związane Uniwersytetem Northwestern lub Biurem Badan Ochrony Człowieka.

Rejestracja wyników ankiety:

Wyniki przeprowadzonej ankiety zostaną zakodowane zgodnie z zasadami w komputerowej bazie danych Uniwersytetu Northwestern w Evanston, Illinois.

Korzyści finansowe:

Z udziałem w ankiecie nie sa związane żadne koszty. Udział w ankiecie jest niepłatny.

Twoje prawa:

Twoj udział w ankiecie jest dobrowolny i w każdej chwili możesz się z niej wycofać. Jeśli nie chcesz nie musisz odpowiadać na wszystkie pytania zawarte w ankiecie.

Kontakt:

Jeżeli masz jakiekolwiek pytania związane z ta ankieta proszę skontaktuj się z Katarzyną Kadelą wysyłając e-mail na adres: k-kadela@northwestern.edu

Pozwolenie:
Zapoznalam sie z trescia zawartej tutaj informacji. Mialam mozliwosc zadawac pytania i uzyskalam na nie odpowiedzi. W przypadku dodatkowych pytan wiem do kogo mam sie zwrocic. Zgadzam sie wziac udzial w opisanej powyzej ankiecie i otrzymam kopie tego zezwolenia po jego podpisaniu.

______________________________________________
Imie i Nazwisko (czytelne i podpis) osoby bioracej udzial w ankiecie

______________________________________________
Imie i Nazwisko (czytelne i podpis) osoby prowadzacej ankiet

Appendix 5: Statements from Local Contacts

Text of an email from gynecologist who owns a private practice in Mszana Dolna, Poland:

“Potwierdzam mozliwosc przeprowadzenia ankiety przez Katarzyna Kadela wscrod pacjentek mojego gabinetu (okolo 100- 150 osob).

Dorota Przeklasa
Specjalista Ginekolog-Poloznik
Mszana Dolna”

Translation:

“I authorize Katarzyna Kadela to survey patients in my practice (approximately 100-150 people).

Dorota Przeklasa
Gynecologist
Mszana Dolna”

Text from an email from a gynecologist who owns a private practice in Myslenice, Poland:

“Serdecznie zapraszam w okresie letnim do mojego Gabinetu Lekarskiego celem przeprowadzenia ankiety z moimi pacjentkami.

z wyrazami szacunku

Barbara Dziewońska
Translation:

“I sincerely invite you [Katarzyna Kadena] during the summer to my medical clinic for the purpose of conducting surveys of my patients.

Respectfully,

Barbara Dziewonska
Gynecology Clinic
Kazimierza St. 35A
32-400 Myslenice
Poland”

Appendix 6A: Works Cited


Appendix 6B: Works Consulted


**Appendix 7: Budget for International Travel**

A roundtrip airline ticket from Chicago to Krakow, Poland costs approximately $1500.

**Appendix 8: Qualifications to Translate English-Polish and Polish-English**

Katarzyna Kadela was raised in a bilingual household. She was born in Poland and is a native speaker of Polish. She moved to the United States at the age of four and attended school in the United States from kindergarten onward. She also attended Saturday Polish school from age six until age seventeen. Upon completion of a written exam and a research paper that was defended before a panel of teachers, she graduated and received a diploma. Additionally, she has been volunteering as a Polish Interpreter at the Community Health Clinic in Chicago, IL.