IMPROVING ACCESS TO CARDIOVASCULAR PREVENTIVE HEALTH CARE FOR THE UNINSURED POLISH POPULATION IN THE GREATER CHICAGO AREA- EXPERIENCE FROM THE POLISH AMERICAN ATHEROSCLEROSIS RISK FACTOR MODIFICATION (POLAARIS) PROJECT

By

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ABSTRACT

Background: Healthcare system in United States is faced with a unique challenge of catering to a population that is racially, culturally and linguistically diverse. Efforts to provide health care appropriate to each of such populations are a part of the national health care agenda. Yet, certain locally diverse minorities might be neglected due to their confined location in a part of the country. The Polish community is one such linguistically and culturally unique population in the Chicago area, within the county of Cook in the state of Illinois. The Cook County Health System provides health care for the un- and under insured population in the county, but specific language and cultural barriers exist for the uninsured Polish population.

Objective: To improve access to cardiovascular preventive health-care for the uninsured Polish population in Chicago area by analyzing barriers and devising effective and sustainable solutions.

Methods: Efforts were made to establish community collaboration in order to assess needs and devise effective solutions towards breaking the barriers to provide health care to the Polish population. Care was provided at a geographically proximate health center. Screening using a non-lab based cardiovascular risk assessment tool identified individuals at high risk of adverse cardiovascular outcomes. Such screening was offered in health fairs at community gatherings (a Polish cultural festival and a local community church). Individuals with no access to health care providers were given follow-up appointments at a nearby county health clinic. As needed, all these individuals received continuity care with primary care physician and/or a cardiologist.

Results: Strong collaboration was established between the health care facility and a community organization named Polish American Association. Apart from providing insight into the barriers faced by the Polish population in accessing health care facilities, this organization identified effective venues for health screening, created necessary publicity and also facilitated Polish translation services at the local health clinic, the Logan square health center.

A total of 125 patients were screened. 63 of them were identified as high risk and not having access to a provider. All these individuals were given appointments for a clinic visit at the Logan square health center, a geographically proximate health clinic. 54% of those screened had >20% risk of a 5 year adverse cardiovascular outcome. 34 of the 68 have been seen in follow-up clinic till date. 56% of them had a new medication prescribed in their first clinic visit while 38% had an investigation ordered. All were provided with a primary care physician while 38% needed follow-up with a cardiologist.

Discussion: Health care organizations need to be aware of any linguistically and culturally unique populations being served. Collaboration with established community organizations and reallocation of resources within the health system could be an effective way to cater to the needs of such populations.

CHAPTER 1

BACKGROUND

HEALTH CARE FOR MINORITIES:

As the population of the country becomes more diverse, the healthcare providers and systems face many challenges to provide culturally and linguistically appropriate care for the ethnic minorities. Compounding the situation are barriers like access to care, lack of health insurance, etc., which may be more prevalent in minority populations. Ethnic groups like Hispanics, Asians and South Asians are distributed in a wide geographic area in the Nation. Such populations that form the majority of the minorities are catered to in the national or local government agenda. Certain linguistically and culturally unique populations might be confined to a defined geographic area because of which, providing appropriate care specific to their culture/language might not be relevant to state or federal initiatives. The Polish population in the Chicago area is one such neglected linguistically and culturally unique group.

UNINSURED POLISH POPULATION OF THE GREATER CHICAGO AREA: [1]

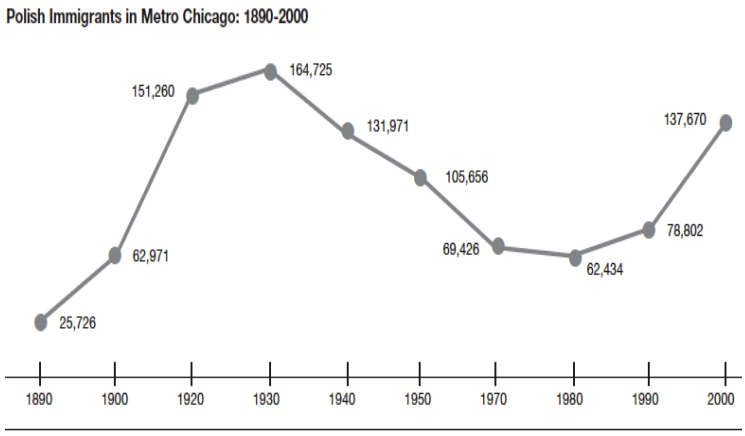


Figure 1: Trend of Polish Immigrants in Chicago area showing a temporal increase.
Source: *The Polish Community in Metro Chicago. A community profile of strengths and needs.* A Census 2000 report. Reproduced with permission from the Polish American Association

7.5% of the people in Illinois are of Polish ancestry. 15% of them were born in Poland reflecting a substantial number of recent immigrants. One-third of Polish immigrants in the United States live in the Chicago area making it the most notable Polish- American community in the country. Moreover, the number of Polish immigrants in this region is only increasing over the last decade. (Figure 1) The city of Chicago houses 210,421 individuals of Polish ancestry and constitutes

10.6 % of the foreign born population. Amongst the counties of the metro Chicago, Cook County houses the maximum number of Poles. (Figure 2)

Of the Polish born, there are at least 41,571 who speak English poorly or not at all, 62,000 fall 150% below the poverty line and only 15.8% hold management and professional jobs.

Indians (Asian Indians), Mexicans and Poles constitute 56% of all immigrants in the Chicago metro area. Poles do better than Mexicans and worse than Indians in terms of both education and income (Figure 3) showing that the Polish population is at par in relation to their socioeconomic status with the other established minority immigrants in this region.

Polish Americans in Metro Chicago

	1990	*2000*	*# Change*	*% Change*
Illinois	962,827	932,996	-29,831	-3.1%
Metro Chicago	853,742	820,548	-33,194	-3.9%
Cook County	610,027	530,645	-79,382	-13.0%
Chicago	261,899	210,421	-51,478	-19.7%
Cook (suburban)	348,128	320,224	-27,904	-8.0%
DuPage	105,565	110,425	4,860	4.6%
Kane	21,552	28,020	6,468	30.0%
Lake	54,580	57,249	2,669	4.9%
McHenry	22,519	32,974	10,455	46.4%
Will	39,499	61,235	21,736	55.0%

Figure 2: Distribution of Polish population in Chicago area showing maximum numbers in Cook County.
Source:. *The Polish Community in Metro Chicago. A community profile of strengths and needs.* A Census 2000 report. . Reproduced with permission from the Polish American Association

Education and Income of Major Immigrant Groups in Metro Chicago: Census 2000

	Pct. With HS Degree	Pct. With BA Degree	Median Household Income
Native Born	80%	30%	$50,800
All Immigrants	62%	25%	$46,000
Mexicans	34%	3%	$42,000
Poles	69%	16%	$44,000
Indians	88%	66%	$65,000

Figure 3: Poles in the Chicago area have a socioeconomic status better than the Mexicans and worse than the Indians.
Source:*The Polish Community in Metro Chicago. A community profile of strengths and needs.* A Census 2000 report. . Reproduced with permission from the Polish American Association

Poles are a unique minority in the fact that they get classified as a white race, but hold truly varied needs compared to the rest of the white population. While Poles constitute 23% of the White population in the Chicago area, cultural and dietary practices of individuals of Polish ancestry have been shown to be unique compared to the white population. [2]Hence, the Poles might face unique cultural and language barriers creating a challenge in providing adequate public services.

HEALTH CARE FOR POLES IN THE CHICAGO AREA:

Of the many social needs of a population, there is no doubt that healthcare is a crucial component of well being. Although United States is a multicultural and multilingual society, the health care system here is largely geared towards serving English-speakers.[3-6] Language has been recognized as a significant barrier in accessing health care resources.

Voluntary immigration by itself poses multiple stressors. Studies have shown changes in health patterns of populations with various immigrant groups.[7] Adaptation of the western lifestyle and the complexities of acculturation have been attributed to worse cardiovascular outcomes in certain eastern immigrant populations to the United States. [7, 8]Polish immigrants in Chicago would be no exception and can face similar adverse impact on their health. The low socio-economic profile of the community compounded by the current economic status of the nation makes it highly likely for a significant number of Poles in the Chicago area to not have access to health insurance and hence to health care. The barriers in the culturally ill-equipped health system only magnify the rift between the population and the health care providers.

The Public health system of Cook County: A unique opportunity.

The Cook County Health and Hospitals system (CCHHS), previously named Cook County Bureau of Health Services, is a network of all the Public health institutions in the county of Cook. It oversees a comprehensive and integrated system of healthcare throughout Chicago and suburban Cook County through its hospitals, ambulatory and community health network clinics, public health department, correctional healthcare facility, and outpatient infectious disease center.

Well known as ‘Cook County hospital’, the John.H. Stroger Jr. Hospital of Cook County is the largest of the four inpatient tertiary care facilities of the CCHHS. It is a legendary

institution providing health care to the un- and under- insured individuals since its inception as the 'poor house' in 1835. It has gone through multiple transitions to the current state-of-the art facility serving many patients with no health coverage. Cook County hospital has a mission statement "to provide a comprehensive program of quality health care with respect and dignity, to the residents of Cook County, *regardless of their ability to pay."*

Financial barrier as a cause for limited access to health facilities is practically negligible in the health system available for the Polish immigrants in Chicago. Yet, the high percentage of Polish patients with advanced cardiovascular disease seeking care for the first time at the John.H. Stroger Jr. Hospital[9] and the low number served in the ambulatory clinic closest to the polish neighborhood [10] reflect barriers beyond financial constraints.

Cultural competency of the available Health care system to provide care for Poles in Chicago:

Cultural competency as delineated in the discussion section, reflects the ability of an individual or an organization to be able to provide services that are tailored towards the unique attributes of a specific culture. Poles as an ethnicity belong to the White race, but have unique cultural attributes. The eastern European population (including Poland) has interested the field of International health since the 1990s when mortality rates in adults rose compared to other industrialized nations.[11, 12] The culture of the Polish people is also intertwined with the communist regime of the past with the complicated transition to a free market economy in the 1980s. Szaflarski and Cubbins[13] studied the differences in self reported health between the people in Poland and White population in United States using survey data from 1994. Overall health perception was lower in Poland. While age is an obvious cause of decline in health, the Polish population had a decline in their health status much earlier (early 40s and late 30s) when

compared to their American counterparts. Being female had much worse impact in Poland while socioeconomic factors played a minor role on their health status in comparison to United States. Though other studies[14, 15] from Eastern Europe did not show such significant gender effect, certain methodological issues of these studies limits their generalization to the Polish population. Risk behaviors like smoking and heavy drinking have also been shown to be higher in the eastern European populations including Poland.[11, 16] Perceptions of health amongst men and women are also presumed to be different in the Polish population. Perception of ill health as a sign of femininity and or weakness might limit health-seeking behavior in men.[13] These studies reflect the fact that the Polish population has unique perceptions, culture, food habits and health seeking behavior. There is a lack of insight into the cultural beliefs, health perceptions, risk taking behavior and heath seeking behavior of the Polish immigrants in Chicago and elsewhere in United States. The Polish immigrants are probably faced with an additional barrier of acculturation. Reports suggest a lack of easy cultural assimilation in first generation immigrants[17] making the Polish society a complicated cultural mix of various grades of Polish and American culture.

One of the more obvious unique attributes of a culture is language. Communication barrier is a key limitation in a provider-patient interaction and hence probably the most important aspect of delivering culturally appropriate care. The United States Census report shows that Polish as a household language ranked 6^{th} in 1990 and dropped to 10^{th} in 2000. [6] As detailed above, the city of Chicago and the county of cook has the highest number of Poles compared to any other area in the United States. Yet, there has not been any focused initiative to address the health care needs of the Poles in Chicago. For example there are no cardiovascular health education materials available in Polish anywhere in the CCHS. Most signs in the hospital system are only bilingual with Spanish and English while Polish remains sparse. Also, national organizations like the

American Heart Association have websites and material available in Spanish, Vietnamese, Simplified Chinese and Traditional Chinese, [18] but not in Polish.

The lack of polish interpretation services in the health system is a major barrier to providing health care at CCHS. The John. H. Stroger Jr. Hospital of Cook County is the only health care facility in the County that has in-house interpreters. There are 3 interpreters available during working hours in this hospital while there are none available in any other facilities of the health system. Phone interpretation services are available to the rest of the health system from the interpreters at the John. H. Stroger Jr. Hospital.

Though there are no studies to prove the lack of awareness of specific health related cultural attributes of the Polish population in the CCHS, the lack of accessible language services might be enough proof for a safe assumption of the inadequacies. In summary, the health system in Chicago is in adept for providing culturally competent care for the Polish population.

Ongoing initiatives towards improving health care for the Polish immigrants in Chicago:

There are many Polish organizations catering to professional advancements and cultural enrichment in the Chicago area.[19] The Polish American Association (PAA), as detailed in later sections, is the oldest organization working in social development including limited programs in health outreach. Through the PAA, Polish medical professional organizations frequently conducted health screenings and organized follow-up for individuals with an ability to pay but did not cater to the follow-up needs of those with no insurance and no financial ability to incur the medical expenses. [20]

Health care issues-Scope of intervention for cardiovascular disease:

Over many years, the division of adult cardiology at the John H. Stroger Jr. Hospital of Cook County has noticed a high incidence of advanced coronary artery disease in Polish

individuals. A cross sectional analysis of the cardiac catheterization laboratory data[9] from January 2007 to December 2007, showed that 71% of polish patients who underwent an angiogram were newly diagnosed with coronary artery disease and seeking medical care for the first time (N=35). Almost 35% of them needed surgical revascularization while more than 40% underwent percutaneous coronary intervention. Also, the lipid profiles indicated high triglycerides, low HDL and normal LDL levels. In fact, an institutional learning has been that being 'Polish' is a risk factor for coronary artery disease and that their culturally specific dietary factors play a major role. Such beliefs are contrary to nutritional and mortality data from Poland[21] and studies performed in Polish women in Chicago.[2] Irrespective of the cause, the above-mentioned statistics reflect a great scope for preventive measures for the Polish population who seem to be seeking health care at a late stage of the atherosclerotic process.

A problem analysis study[22] done in a group of 200 adult Poles enrolled in various programs at a not-for-profit organization named Polish American Association (PAA) in Chicago showed that 60% had no contact with a physician in the United States and 73% had no insurance. The average age was 48 years with the median duration to arrival to the United States being 7 years. 62% were women. Of those who were uninsured 70% said that they have heard about 'Cook county hospital' but only 18% knew about any available free health facility in the city. These statistics reflected a need for bridging the gap between the available health services and the Polish individuals in need. The cross sectional sample obtained from individuals enrolled at the PAA was presumed reflective of the community in need, as the PAA has been serving the Polish immigrants for more than 85 years and is well established in the area for providing necessary social services to Polish immigrants. Immigrants in need of other social services often face challenges to access to health care.

I n order to improve and provide culturally appropriate care to the Polish population of Chicago, the primary author of this thesis devised and executed the Polish American Atherosclerosis Risk Factor Modification (POLAARIS) Project.

CHAPTER 2

METHODS

A BRIEF OUTLINE OF THE POLISH AMERICAN ATHEROSCLEROSIS RISK FACTOR MODIFICATION (POLAARIS) PROJECT:

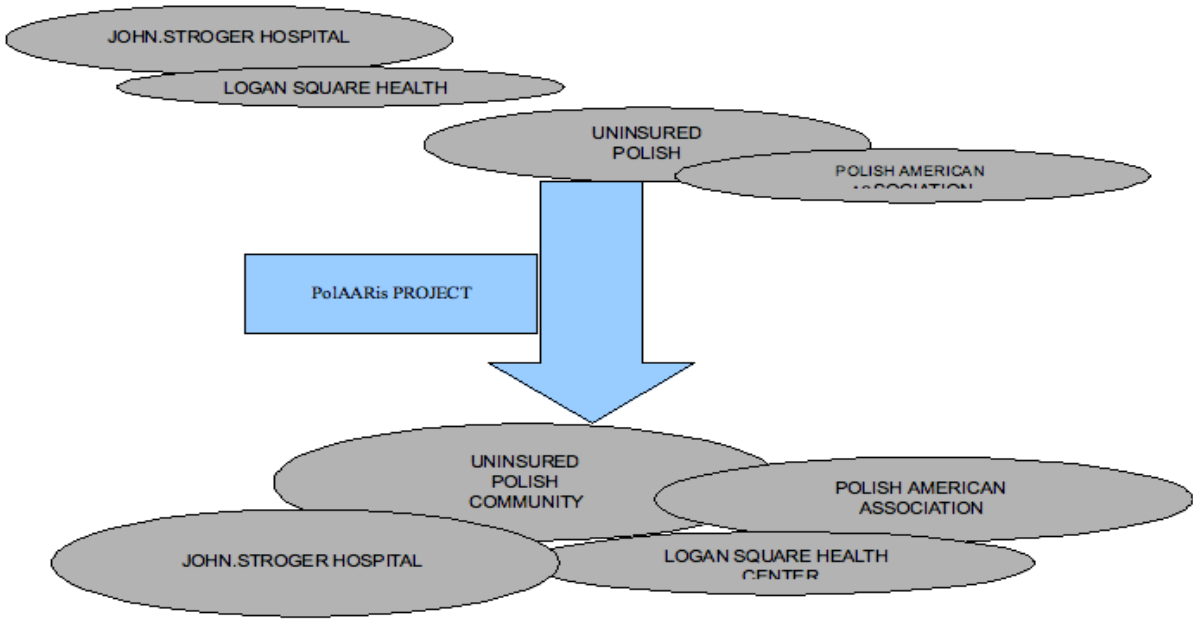


Figure 4: Depiction of the objective of bringing the various organization together on order to provide better care for the uninsured Polish Community in Chicago.

OBJECTIVES:

1. Identify problems and devise solutions to major barriers to providing health care to uninsured Poles in Chicago.

2. Bridge the gap between the available health facilities in the area and the community (Figure 4)

SPECIFIC PRIMARY AIMS:

1. Provide health screening to identify high cardiovascular risk individuals from the target population for appropriate intervention.

2. Provide health education material in Polish.

3. Identify Polish speaking healthcare professionals in order to provide primary and secondary prevention measures to the target population in a culturally effective way.

4. Provide accessible health care in a facility located nearby to the Polish neighborhood.

5. Increase awareness of the availability and accessibility of the health care system.

SPECIFIC SECONDARY AIMS:

1. Provide evidence and generate a petition to the CCHS to focus attention towards providing culturally effective care to the Polish population in Chicago.

2. Propose to the administration of CCHS the community organization collaborative model as used in the POLAARIS project, for future programs.

IDENTIFYING THE POPULATION AT NEED AND AN ACCESSIBLE HEALTH FACILITY: A methodical approach:

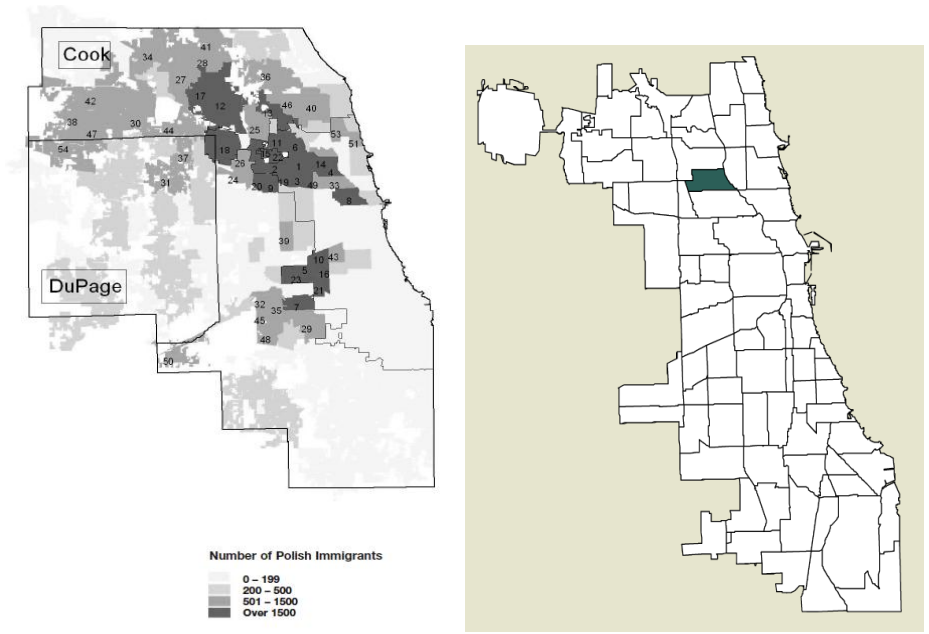


Figure 5: Left: Showing the map of the Chicago Metro area with population density of Polish individuals. The numbers on the map represent Chicago Community Areas (CA). CA –21 named Avondale housed the fourth largest number of Poles. Right: Map of the Chicago is showing Avondale in green.
Source: Left map: The Polish American Association. *The Polish Community in Metro Chicago. A community profile of strengths and needs*. A Census 2000 report
Right map: Chicago Department of Public health, Chicago Community Health Profile- Avondale

The POLAARIS project was initiated by the principal author of this thesis while working as a fellow in the division of Adult Cardiology at the John. H. Stroger Jr. Hospital of Cook County. Though the availability of necessary clinical and personnel (including in-house polish speaking translators) resources at this hospital made it a convenient location for the POLAARIS project, the geographical location of

the hospital in the southwest part of the City of Chicago was far from the "Polish neighborhood" situated in the northern part of the city.

With the help of the population density maps obtained from census reports published by the Polish American Association, a Chicago community area (CA) number 21 named Avondale was identified as the political geographic boundary that encompassed the Polish neighborhood.

Figure 6: Left: Map of Avondale, Chicago Community Area (CA) 21, showing a lack of health care facilities. This CA was initially identified as an epicenter for community outreach for the Polish population.
Right: Map of Logan Square, Chicago Community Area (CA 22) showing abundance of health facilities including a Cook County health systems clinic called Logan Square Health Center. Of note CA 21 area can be seen immediately above and bordering CA 22.
Reproduced with permission from the Chicago Department of Public health, Chicago Community Health Profile-

On further study of CA 21, the lack of healthcare facilities in this area became evident. (Figure 5) The neighboring community areas 20 (Hermosa) and 22 (Logan Square) were analyzed to finally identify a Cook County health facility in CA 21 called Logan Square health center. (Figure 6)

ESTABLISHING COLLABORATION BETWEEN KEY ORGANIZATIONS:

John. H. Stroger Jr. hospital was not an ideal center for community activity and follow-up care because of the reasons detailed above. Most cardiovascular specialty care for the people

of Cook County was provided at this hospital and hence this center would work as a referral center when specialized cardiovascular investigations were needed.

Logan square health center: Assessing the facility and its role for the Project:

The Ambulatory and Community Health Network (ACHN) of Cook County is a part of the Cook County Health and Hospitals System that includes 30 outpatient clinics through out the county of cook. Logan Square health center is one of such clinics serving the northern Chicago and the northern suburbs of the city. This clinic is located in the Chicago community area 22 and has proximity to the Polish neighborhood.

After providing information on possible un-addressed health needs of the Polish population and their residential area in geographic proximity to the Logan Square health center, the leadership of the clinic was eager to extend all possible cooperation to help the Polish community. Less than 1% of the patients served in the clinic were Polish and faced multiple barriers to seek care at this facility.[10] Discussions with the leadership of the health center revealed the following relevant hurdles to the postulated project:

1) Limited staff: The number of patients being seen currently overwhelmed the clinic. The proposed community screening of the Polish population would generate a sudden increase of referrals to the clinic that cannot be handled by the current staff.

2) Language barrier: There were no Polish speaking staff at the clinic and there was no on-site Polish translation service available. The current system in place was to avail the language line phone translation service, which had issues of long waiting times and impersonal interaction with the patients. This made the physician visits of Polish individuals difficult for both the clinic personnel and the patients.

These limitations of the health center would pose as major barriers for any health care

activity involving Polish-speaking patients at this clinic. Also, merely increasing awareness, amongst the Polish community of the availability of free health care in this clinic will defeat the efforts towards an effective and sustainable change. Hence, these limitations were kept in mind while devising specific interventions of the project.

Identifying community leaders: The Hunt for the community organization- 'The Polish American Association':

The melting pot of Chicago is an embodiment of the population of United States that is growing to be multiethnic, multicultural and multilingual. Proving health care for such a population poses multiple challenges. Such challenges are seen the most with community care in preventive medicine. Unless there is a representation of the minority populations in the healthcare system, initiatives tailored towards them will not have the impetus and input for success. Certain minorities in the Chicago area like the African American, Hispanic and Asian communities have a national relevance as culturally diverse minorities and hence various health care organizations have some kind of an agenda to address their needs. Unfortunately, there are no government initiatives addressing the needs of the Polish community. A lack of representation of the Polish community in the Public health system makes providing culturally effective care more challenging. Such limitations stress the role of identifying and collaborating with non-health care workers and community leaders.

As most minorities are represented to some extent on university campuses, an initial attempt was directed to seek assistance from Polish student organizations of the many university campuses in Chicago. With no response from these student bodies, attention was turned to Polish Professional Medical Associations with yet another disappointing result. Finally, on discussions with a Polish interpreter at the John.H.Stroger Jr. Hospital, the Polish American Association was

discovered.

Polish American Association (PAA), formerly named Polish Welfare Association, was founded in 1922 and has served the Polish community in areas of employment, education, immigration and social services. Initial communication and discussions with the organization confirmed the dire necessity of improving health care access to the Polish population. The organization had also made previous unsuccessful attempts urging the county health system to increase hiring of Polish speaking health care providers.[23] The PAA was delighted at my proposal of the project and has since played a very crucial role in mobilizing the community, proving the forums, guiding translation and mediating the health clinics of the POLAARIS project.

Mobilizing manpower for the project in order to address lacunae within the health system:

A campaign to recruit volunteers was undertaken. The following groups were targeted and recruited as detailed:

1) Health care workers: Posters (Appendix A) were placed throughout the John. H. Stroger Jr. Hospital of Cook County and Rush University Medical Center (which is in close physical proximity to John Stroger hospital) for Polish speaking health care providers to volunteer their time for the project. Three polish speaking physicians (Dr. Robert Palusinski, Dr. Marek Cena and Dr. Gregory Paiez and one Polish-speaking nurse (Barbara Kacmar) were identified and recruited as volunteers. Other English-speaking physicians offered to volunteer for the screening health fairs.

2) Polish interpreters: The Polish interpreters at the John. H. Stroger Jr. Hospital of Cook County agreed to volunteer for translation services based on their availability.

3) Polish American Association: The Polish American Association would provide individuals for

translation during the health screening and clinic visits.

IDENTIFYING A COST EFFECTIVE INTERVENTION TO REDUCE THE BURDEN OF DISEASE: A CARDIOVASCULAR PREVENTIVE STRATEGY

Cardiovascular disease epidemiology:

The diagnostic and therapeutic burden of Cardiovascular diseases on the health care system of United States is Herculean. An estimated 81,100,000 people in the United States have one or more of the cardiovascular diseases.[24] Coronary heart disease, cerebrovascular disease and aorto-peripheral disease constitute the majority of cases of cardiovascular diseases. In 2006 there were 17,600,000 people with coronary artery disease (CAD), 6,400,000 individuals affected by stroke and about 8 million affected by peripheral arterial disease in United States.[25] The cost of heart disease and stroke in the United States, including health care expenditures and lost productivity from deaths and disability, is projected to be more than $475 billion in 2009.[26]

Prevention of cardiovascular disease:

With rising healthcare costs and increasing population, a focus on primary preventive services and early risk factor modification has become important, more than ever. Preventive care at the population level needs to factor in an appropriate balance between expected benefits versus cost of preventive measures. While general life style changes needed for healthy well being can be intuitively preached, advocating any kind of intervention for a specific goal of risk reduction needs a scientific and an evidence based approach. Moreover, for any preventive measure to yield the most cost effective outcome, interventions need to be targeted towards the highest risk population.

Cardiovascular disease risk factors: What we can change and what we cannot?

Risk factors of cardiovascular disease can be divided into non-modifiable and modifiable:

Non-Modifiable risk factors are:

Age: Data from the Framingham study indicates that the annual rates of first major cardiovascular event increases from 7 per 1000 men at ages 35 to 44 years to 68 per 1000 at ages 85 to 94 years. [27]For women, comparable rates are achieved ten years later in life, with the gap in incidence narrowing with advancing age.

Gender: Male sex is one of the best-documented and strongest risk factors for coronary artery disease (CAD). The interplay between gender, age and other risk factors seems complex and not clearly understood.[28] The rate of age-related increase in incidence of CAD among men declines after middle age, but continues to increase in women during and after menopause so that rates are nearly equal in men and women in the older age group. Though initial belief in the lower rates of cardiovascular events in pre-menopausal women was attributed to sex hormones, later trials showed that hormone replacement in post –menopausal women did not decrease the event rate and in fact suggested an increase in adverse outcomes. [29, 30]

Genes: Early studies of coronary artery disease in young individuals recognized clustering in families with familial dyslipidemias.[31] Subsequently, studies have identified many genes affecting lipid metabolism at various levels: genes affecting hemostasis, genes affecting tissues of the arterial wall and the inflammatory response and genes affecting the response of plasma lipoproteins to diet.

Modifiable risk factors are:

Blood Pressure: High blood pressure has been found to be associated with adverse cardiovascular events in both clinical [32] and epidemiological studies. [33] A meta-analysis[34]

of 9 major studies showed a direct, continuous and independent association between blood pressure and risk for CAD with an even stronger association with stroke.

Cholesterol: Early studies established the utility of high cholesterol in predicting coronary artery disease based on total cholesterol measurements. [35] Later advances in lipid analyzers delineated the specific association of Low Density Lipoproteins (LDL). [36]The Framingham heart study,[37] the Multiple Risk factor intervention trial[38] and the lipid research clinics trial [39] have all shown a direct relationship between levels of LDL (or total cholesterol) and the rate of new-onset CHD in men and women who were initially free of CHD.

The association of a low HDL cholesterol concentration with CAD was initially proposed in 1956 [36]but it was not until 20 years later was its role reinforced and recognized as a powerful risk factor of CAD.[40] Though population studies are still emerging, observational and small cohort studies have shown a confirmatory association of CAD and lipoprotein (a) and small dense LDL.

Physical inactivity: Moderate physical activity favorably affects HDL cholesterol, blood pressure, body weight, and insulin resistance and indirectly reduces the risk of CAD.[41] Though certain reports including the ecological comparisons of the Seven Countries study[42] showed no association with physical activity and decreased risk of CAD, multiple longitudinal studies have generated persuasive evidence that physical activity is a modifiable trait that can have a protective affect against CAD. [43, 44]

Tobacco exposure: Smoking cigarettes have been shown to increase the onset and progression of atherosclerosis and hence increase the risk for clinically manifest CAD. A single mechanism has not been delineated, but the effects of thousands of chemicals in tobacco smoke offer many possibilities like vasospasm, endothelial damage, immune response, inflammatory cytokines,

mutagenesis, thrombosis, etc. [45, 46] The risk of CAD returns to general population risk after more than 2 years of sustained abstinence from tobacco exposure.

Diabetes: Diabetes is classically considered an endocrine disease. The multiple end organ damage caused by the glycosylation products of prolonged hyperglycemia is manifested through vascular changes making diabetes more of a vascular disease in its later stage.[47] In combination with obesity, insulin resistance, hypertriglyceridemia and low HDL the metabolic syndrome affects almost 1 in 3 adults in the United States and is associated with a greatly increased risk of CAD. [48]

Overweight: More than half of Americans are overweight or obese and hence at an increased risk of mortality and of coronary artery disease.[49, 50] Overweight has been directly associated with metabolic syndrome which in turn increases risk for coronary artery disease.

Other novel risk factors: Inflammatory markers like C-reactive protein (CRP) and highly sensitive –CRP, stress, Lipoprotein-a, Type A personality, depression, etc. have been shown to promote the risk of coronary artery disease.[51] In view of the scope of the current document limited to cardiovascular risk assessment these novel risk factors are not detailed further. Studies have established strong association of the emerging risk factors to adverse outcomes in cardiovascular disease, but as outline in detailed in later sections, none have shown a consistent and significant impact on risk prediction models.

Individual vs. population approaches to improve health:

As outlined in the classic paper by Geoffrey Rose[52] in 1985, there are two approaches to implementing preventive care:

1) Population approach: This strategy involves efforts towards controlling the determinants of incidence of a particular disease targeting an impact at the population level. Though the potential

advantages like radical change, large impact and slow behavioral transition for the population makes the population strategy a widespread effective method, it involves policy changes, media involvement and a large-scale effort by the entire health care sector providing care to the relevant population.

2) Individual approach or 'High-risk' strategy: The high-risk strategy is an individual centered preventive strategy where a risk estimate for a future disease or an adverse event occurrence is estimated in order to intervene in the present day. Lucrative advantage for this measure is the ability to truncate the risk distribution of the population by making a cost effective intervention in the highest risk individuals. Also, individuals are more likely to adhere to necessary interventions as risk is being personalized. Compared to the population approach, this strategy has a limited scope and one of the major limiting steps is the ability to be able to accurately assess future risk.

The principles of preventive medicine aim at avoiding the occurrence of future events by interventions in the present day. In order to do so, one needs to have the ability to predict future events based on current available features of a population. As discussed above, the risk factors that we attribute to the causation of atherosclerosis and coronary artery disease were estimated from meticulous epidemiological studies like Framingham study and Seven countries study. Such identified risk factors are then used to build the best possible comprehensive risk prediction model.

Risk prediction models:

The most effective preventive strategies aim at the highest risk population making appropriate risk prediction an essential beginning point. Risk prediction models are created from data obtained from studies of representative individuals. Traditionally, risk of the natural

occurrence and progression of diseases like heart disease has been established from large epidemiological studies.

A brief review of risk prediction model building: There are a very few non-infectious, chronic diseases for which a single etiological factor has been identified. Majority of such illnesses have an association with multiple risk factors. Prior to the Framingham Heart study (FHS), the objective of many scientific investigations was to find the 'causative factor' of cardiovascular disease. More than 50 years of observational data from the FHS created the paradigm of 'risk factors' leading to cardiovascular disease and revealed the importance of early detection, frequent measurement and tailored modification of these risk factors.

For an individual risk factor to be used as an effective prognosticator, its distribution amongst the group with the disease and the group without the disease should be well separated. Simulation studies show that a risk factor needs to have an extremely strong association with the disease outcome, in the magnitude of a relative risk of over 200, for it to provide effective prognostic information in an individual.[53-55]Yet, in epidemiological studies the relative risks run in low numbers like for example, a relative risk of 1 to 2 in the Framingham study.[56] Hence, there remains a challenge in maximizing the predictive power of the available individual risk factors. While creating a model from observational data obtained from representative studies, the statistical methodology distinguishes candidate prognostic factors from noise and finally constructs a model with a combination of individual associations of the various risk factors in an effort to maximize the predictive power.

There are many risk prediction models in cardiovascular diseases. Most aim at predicting the preventable adverse outcomes of atherosclerotic diseases like stroke, myocardial infarction, death, etc.

The Framingham epidemiological study has been the most influential in risk prediction in cardiovascular medicine.

Framingham risk model:

The Framingham heart study is recognized as a pioneer epidemiological study in establishing cardiovascular disease risk prediction models. The National heart, Lung and blood Institute (NHLBI), known as National Heart institute in 1948 spearheaded this study. Under the leadership of Dr. Thomas Royle Dawber, who was the first director of the study, the people of Framingham, Massachusetts were enrolled as healthy volunteers to follow the onset and progression of cardiovascular disease. Heart disease was souring in incidence and causing an epidemic impact in the United States and the true etiology was unknown at that time. Since it's inception, information from the Framingham heart study has revolutionized not only the understanding of cardiovascular disease but also has set a new paradigm in risk assessment and risk factor model development. At present, three generations have been studied in the FHS with continuous follow-up of clinical data along with a unique ability to retrospectively analyze frozen blood samples using the current technological advancements in laboratory techniques.

The risk factor model developed from the Framingham heart study is probably the most popular and validated cardiovascular risk assessment tool available. The Framingham risk model has been validated and found to have an accurate estimate of CVD risk in many populations. Contrary to such findings, studies in Europe have shown that risk prediction utilizing Framingham risk calculator was not entirely suitable without a regional recalibration.[57-60] Details and limitations in generalizability of the model (due to the original population being from a homogenous population belonging to a single town) are mentioned in detail in later sections.

Wilson et al[56] published the first cardiovascular risk assessment model in 1998. Using

12 year follow-up data from the Framingham study they constructed separate score sheets for men and women that had weighted points for the following risk factors: 1) Age 2) Total Cholesterol (or Low Density Lipoprotein cholesterol) 3) High Density Lipoprotein cholesterol, 4) Blood Pressure, 5) Diabetes and 6) Smoking. This risk calculator predicts the 10-year incidence of Coronary Heart Disease (CHD) (angina pectoris, recognized and unrecognized myocardial infarction, coronary insufficiency and coronary heart disease death) and Hard CHD events (total CHD without angina pectoris). The Receiver Operator Curves of the risk factors studied in the study by Wilson et al[56] showed a C- statistic ranging from 0.68 to 0.77 for all the above-mentioned variables.

The National Cholesterol Education Program expert panel Adult Treatment Panel III report [61] was the first national document that stressed risk assessment using multiple risk factors for effective primary prevention. Utilizing data from Framingham Study the ATP III proposed a simpler risk calculator, which predicted the hard outcomes of myocardial infarction or coronary death. Over the decade, various investigators have used data from FHS creating 11 different risk calculators for various adverse outcomes in cardiovascular disease.[62]

Limitations of the Framingham risk model:

What holds true for weather forecasts and predicting the financial markets applies to future risk estimation in medicine: they are not perfect. The Framingham heart study has provided an immense wealth of information on our understanding of the multifactorial etiology of cardiovascular disease and has done fairly in risk prediction, but is definitely not a perfect model. A critical review of few of the characteristics of this model follows:

1) **Accuracy/Internal Validity:** Wilson et al[56] showed in their study that the ROC curves from this study showed that the area under the curve (AUC) is >0.5. Though not perfect, the C statistic

associated with all the risk factors were between 0.68 and 0.77 for both men and women, reflecting good discrimination compared to random chance.

2) **Generalizability/External validity:** Framingham heart study included middle class white population from a single town in Massachusetts. Hence, the external validity and portability of Framingham risk score can be questioned while applying to diverse populations. D'Agostino et al [63] utilized six non-Framingham cohorts for comparison that included white Americans, Black Americans, Hispanics, Japanese Americans and Native Americans. The Cohort studies to which these populations belonged were: Atherosclerosis Risk in Communities (ARIC study: 1987-1988); The Physicians Health study (PHS: 1982); Honolulu Heart Program (HHP-1980-1982); The Strong Heart Study (SHS-1989-1991) and Cardiovascular Heart Study (CHS-1989-1990). Utilizing data from these studies, the investigators calculated, for each cohort, their "own" sex-specific Cox regression functions. By computing relative risk comparisons, discrimination and calibration coefficients the authors concluded that the Framingham heart study risk prediction did reasonably well among white and black men and women but needed recalibration for risk estimation in Japanese Americans and Hispanic men and Native American women. Similar findings of overestimation utilizing the FHS risk model were duplicated in the English[57] and Danish[60] populations. The regional recalibration needed to adjust the FHS risk score, for accurate estimation requires both cross-sectional and follow-up data from the local population. Hence while using the FHS risk model for unique populations, such a limitation in generalizability always makes it possible that the model might over or under estimate risk leading to over treatment or, more dangerously, under treatment respectively.

3) **Newer risk factors:** Many novel risk factors have been identified since the first risk calculator from the FHS. Also, certain known risk factors like family history have not been included in the

original Framingham risk model. Though novel variables like C-reactive protein, Lipoprotein associated phopholipase-A2, Vitamin B-6 deficiency, Hemoglobin A1c have been found to have an independent association with cardiovascular disease, comparison of the AUCs of the traditional Framingham risk score and a model with the addition of each novel risk factor showed minimal to no significant improvement in the predictive power of the model.[64, 65] On the contrary, Cook et al[66] utilizing reclassification index found some improvement with high sensitivity c-reactive protein. A comprehensive study of these studies was undertaken by the United States Preventive Task force and concluded that there is not enough evidence to incorporate these novel risk factors for risk prediction amongst the general population.[67]

4) **Cost:** Apart from the methodical limitation in its portability, the global utilization of the Framingham risk model is probably also limited by the cost involved in accurate measurements of the individual factors of the model. Of the variables, the blood cholesterol test proves to be the most expensive. Such screening can be performed with relative ease in a physician's office, but is faced with many hurdles for community screening. Advances in finger stick blood testing technology has alleviated some of the hurdles of sample collection, storage and transportation to a laboratory, but has made the ordeal of screening with the FHS calculator less economical.

Many of these limitations made the Framingham model unfavorable for use for the POLAARIS project. Cost of finger stick cholesterol testing was prohibitive and regular blood draws had issues of availability of lab personnel for screening days. Moreover it was anticipated that most of the individuals who would make use of the services of the POLAARIS project were new to the Cook county health system and hence their lab work could not be processed right after community screening.

Non-lab based cardiovascular risk assessment model-The World Health Organization (WHO) and International Society of Hypertension (ISH) Initiative:

Keeping in mind the developing and under-developed parts of the world, the World Health Organization and the International Society of Hypertension created non-lab based risk prediction charts utilizing a modeling approach.[68] A set of individual level cardiovascular disease risk profiles were generated using population distribution data from the Comparative Risk assessment study.[69] Then, the risk factor profiles were combined with relative risks of each risk factor and population level absolute risks. Final modeling was performed to predict the risk of non-fatal and fatal myocardial infarction and nonfatal and fatal stroke. The Comparative Risk assessment study was a global initiative to estimate the contributions of selected major risk factors to global and regional burden of disease. 26 different risk factors from various disease entities were selected and expert working groups undertook a comprehensive review of published work and other sources—e.g., government reports and international databases—to obtain data on the prevalence of risk factor exposure and hazard size for 14 epidemiological regions of the world.

Validation of the non-lab based model: As described above in context of the FHS model, every risk prediction model needs to be validated to assure portability. Using data from the National Health and Nutrition Examination Survey (NHANES) epidemiological follow-up study cohort Gaziano et al [70] validated the WHO/ISH risk charts. The cohort included 6186 individuals who did not report any cardiovascular disease (myocardial infarction, heart failure, stroke, angina) or cancer in their surveys. Baseline data were obtained from initial encounters between 1971 and 1975. 21 year follow-up outcome data were used to validate the traditional laboratory-based risk prediction model with the non-laboratory based model.

The laboratory based model included the following variables: sex, age, systolic blood pressure, smoking status, total cholesterol, reported diabetes, and current treatment for raised blood pressure. Unlike the traditional Framingham risk model, High-density lipoprotein (HDL) was not included in the prediction model, as it was not measured in the NHANES epidemiological follow-up data. The non-laboratory based model utilized similar variables and replaced the lab tests for body mass index. Cardiovascular disease outcomes of death, myocardial infarction, stroke, congestive heart failure, and coronary revascularisation including coronary artery bypass grafting and percutaneous transluminal coronary angioplasty were collected from designated follow-up studies in 1982–84, 1987, and 1992. [71-74]Using a Cox regression model the ROC curves for predicting a 5 year cardiovascular risk (fatal and non-fatal) was identical for both the models tested.

The c-statistic revealed a good discriminatory power for both the models while the Hosmer and Lemeshow goodness of fit test showed good calibration. The authors concluded that the non-laboratory based model is at least as good as a laboratory based cardiovascular risk prediction model, especially to be used for the American population.

LOGIC MODEL FOR THE POLAARIS PROJECT:

A logic model is a pictorial or graphical representation of project flow, which can be used for effective communication to stakeholders, maintain direction and access success of the project.

There are 3 types of logic models that can be used depending on the relevance of the message one wants to communicate:

1) Theory approach model: This model stresses on the theoretical aspects of change the program is aiming for. It covers explanation of the reasons why a specific problem was identified, how

and why certain strategies were or will be chosen and connect the problems to effectiveness of the intervention. Most often such models are used for initial buying in of the stakeholders.

2) Outcomes approach model: Such a model is best utilized in early planning and implementation of a program. It connects resources, activities and keeps the desired outcomes in perspective. Because the model outlines the approach and expectations of the project, it can be used to device effective evaluation and reporting strategies.
3) Activities approach model: The activities of the project are stressed the most in this model. Various planned activities of the program are connected to map the processes. It specifies the details of what activities will be performed once the project is initiated.

An outcomes approach model (Figure 7) was build for the Polish American Atherosclerosis (POLAARIS) Project in order to have a broad view of the objectives.

POLISH AMERICAN ATHEROSCLEROSIS RISK FACTOR MODIFICATION (POLAARIS) PROJECT IMPLEMENTATION

Health screening:

Funding to cover basic non-personnel expenses was obtained from a community action grant of the American Heart Association Midwest affiliate (Appendix B). The funding organization had no involvement in any part of the planning or execution of the project.

Screening tool: As mentioned in detail in previous sections, the pros and cons of the available cardiovascular risk assessment tools were probed and a non-lab based screening tool from the study by Gaziano et al[70] was selected for screening. The study provided with separate screening tools for men (Appendix C) and women (Appendix D) that calculated a 5 year fatal and non-fatal risk of adverse cardiovascular events utilizing the following variables: 1) History of diabetes; 2) Smoking status; 3) Age 4) Body Mass Index and 5) Systolic Blood pressure.

Physician and nurse volunteers measured height and weight with a Health O Meter® physician balance beam scale and a body mass index (BMI) was calculated utilizing an electronic BMI calculator. Blood pressure was measured using an Omron® HEM-432C manual inflation blood pressure monitor. Polish-speaking physician volunteers and personnel from the Polish American Association collected the historical variables and provided translation as needed.

The risk calculation instrument provided a color-coded classification of individuals into the following risk categories for a combined fatal and non-fatal adverse cardiovascular outcome in the next 5 years:

1) Low: 5-10% with a color-coded dichotomization between <5% and 5-10%

2) Moderate: > 10-20%

3) High: >20% with a color-coded dichotomization into 20-30% and >30%.

Educational material: As mentioned in previous sections, there is a dearth of health education material in Polish language. Material were created in English by the primary author, translated to Polish by Dr. Robert Palusinksi and proof read and edited for easy readability by non-medical personnel of the Polish American Association. Pamphlets were printed in Polish language on hypertension (Appendix E1 and E2), heart attack (Appendix F1 and F2) and cholesterol (Appendix G1 and G2). Additional materials in Polish were identified to be available from the Pharmaceutical Company, AstraZaneca who provided the same at no cost. The later addressed the topics on adverse cardiac effects of cigarette smoking and healthy nutrition.

PROCESS

INPUTS

--Funding for printing educational material in Polish, screening venue, advertisements,etc

--Physician volunteers

--Community volunteers

--Accessible health facility.

POTENTIAL PARTNERS

--Polish American Association (PAA)

--Logan Square Health Center (LSHC)

ACTIVITIES

--Identify and establish collaboration between community organization and accessible health facility.

--Create educational material in Polish

--Provide cardiovascular risk screening.

--Provide follow-up care for the highest risk individuals

--Network with other free clinics

OUTPUTS

--Collaboration between PAA and LSHC created

--Educational material in Polish created.

--Screening provided and high-risk individuals provided with medical care.

--Increased awareness of the Polish community regarding the free health facilities.

OUTCOMES

SHORT TERM

--Provide CV risk screening for Polish individuals

--Identify high CV risk individuals by screening.

--Identify barriers to care and device interventions.

INTERMEDIATE

--Provide ongoing medical care for the high CV risk individuals

--Provide voluntary translators from the community to the Logan Square health center.

--Consolidate available resources of Polish speaking providers.

LONG TERM

--Petition to the county health system to recruit Polish-speaking health providers to the LSHC

--Provide official translation services on a regular basis at the LSHC.

ASSUMPTIONS

--Partnership between Polish American Association and Logan Square Health Center will create culturally effective health care.

--Language is the most important barrier for the Polish community in Chicago to seek health care and for the health care facility to provide care.

Figure7: Logic model for the Polish American Atherosclerosis Risk Factor Modification (POLAARIS) project

Summer screening: (Appendix H) The first health screening was organized at the largest Polish gathering in Chicago, the Taste of Polonia. The Taste is an annual cultural event organized by the Copernicus center (a Polish cultural institute in Chicago) as a four-day event during the labor-day weekend. Around 30,000 people attend this festival every year for food, fun and frolic. In collaboration with the Polish American Association, a booth was set up to provide health screening and distribute educational material. Keeping in mind the limitations in the resources for follow-up of the individuals in need, health screening was provided only for one day on September 5th 2009. The final risk score was communicated and follow-up provided to those in need as mentioned below.

Publicity: Local Polish media provided with effective coverage for the Health screening booth at the Taste of Polonia. A local TV channel named Polvision aired an interview with the organizers providing the importance, need and relevance of the health screening. Polish radio aired two talk shows with Dr. Robert Palusinski publicizing the screening booth at the taste of Polonia and stressing the importance of risk factor identification and modification for heart disease.

Winter screening: (Appendix-I) After completing follow-up of the individuals from the first screening, a second phase of screening was organized at a local community church. Using the same methods and tools used at the summer screening, risk assessment was performed for individuals in November 2009 and follow-up care arranged as detailed below.

Publicity: The Polish American Association provided publicity for the health screening and individuals were pre-registered for the winter screening event.

Follow-up care:

All individuals with a high-risk score (5 year fatal and non-fatal adverse cardiovascular event rate >20%) based on the risk prediction tool were given follow-up appointments on set dates at the Logan Square Health center provided they did not have a primary care doctor or had no resources to seek continued medical care. Appointment cards (Appendix J) were given to these individuals

specifying the date and location of the clinic along with the description of what their risk meant. Individuals who had access to medical care were educated on the nature of the risk score and encouraged to follow-up with their physician. All written information was printed in Polish.

Clinic visits at the Logan square health center:

Keeping in mind the barriers at the Logan square health center, follow-up for patients from the summer screening was completed prior to embarking on recruiting more patients in the winter. The following solutions were also devised to solve the barriers of language and limited clinic capacity.

Breaking the manpower deficit: In order not to burden the existing staff at the Logan square health center, special project clinic days one day a month, were reserved to see the individuals given follow-up appointments from the health screenings. Two Polish-speaking physicians and two non-polish speaking physicians volunteered their time and had 2 examination rooms dedicated for the POLAARIS project. Individuals were seen only once at the Logan square health center and for further follow-up care were plugged into the county health system**.**

Breaking the language barrier: The Polish American Association provided one health outreach worker assigned exclusively to the Logan square health center during the assigned clinic days. The health out reach worker had experience in providing medical translation. Translation services were provided both at the registration desk and for the non-polish speaking volunteer physicians during patient encounters. Bilingual pre-registration patient (English and Polish) forms were also created. In order to provide effective continuing care for these patients, 2 polish internal medicine residents were identified at the John. H. Stroger Jr. Hospital of Cook County who obliged to absorb the patients into their clinic over a period of time. Referrals were placed as needed.

The following were the objectives of the follow-up clinic visit:

1) Register the patients with the Cook County health and hospitals system.

2) Provide a focused cardiovascular assessment and reassess risk factors.

3) Order basic lab works for individuals who need them.

4) Provide with cardiovascular investigations if needed.

5) Provide follow-up with a cardiologist if further work-up was needed.

6) Provide follow-up with a primary care physician within the public health system with providers who can speak Polish.

DATA COLLECTION:

The variables collected as a part of the health screening were extracted from the scoring sheet of individuals (Appendix C and D). No personal information was recorded on the sheets. The variables were: 1) Gender, 2) Age group 3) Systolic blood pressure group 4) Body Mass Index group 5) Diabetes Mellitus (self reported), 5) Smoker (self reported).

The clinical information of all the patients who were followed-up at the Logan square health center was entered into a database as pre-planned for the POLAARIS project. All personal identifiers were deleted. Appendix K displays the variables from the data collection instrument used to create this project database.

The POLAARIS project was in compliance with the policies of the institutional review board of John. H. Stroger Jr. Hospital of Cook County.

STATISTICS

Data was entered into Excel® and Numbers® worksheets as a part of monitoring of the POLAARIS project. All identifiers were destroyed from the data of follow-up of the patients. Simple frequencies were calculated using Excel® on the de-identified data. All data from the screening instruments was in the form of categorical variables. Prevalence of risk factors was expressed as a percentage of individuals screened. A 2-tailed Chi-square test was used to estimate significant differences in the risk variables between individuals with a low risk (< 20%) and those with a high CV risk (>20%). For the continuous variables from the follow-up data, median and standard deviation were

calculated.

Presumptive calculations: The prevalence of high-risk (>20%) cardiovascular profile individuals in the screened Polish population was used to calculate the estimated prevalence of high-risk individuals in the community. To minimize exaggeration, a conservative assumption was made that the poorest of the Polish population were screened during the health fairs. As mentioned in earlier sections, 62,000 poles were >150% below poverty line in the Chicago area in 2006.[1] The high-risk group had two subdivisions of 20-30% risk and a >30% risk. An average 5-year event rate of 25% was used for the former group while an average risk of 30% was used for the later. A steady annual event rate was assumed and an estimated event free survival over a five-year period plotted.

All statistical calculations were perfomed using Excel®.

CHAPTER 3

RESULTS

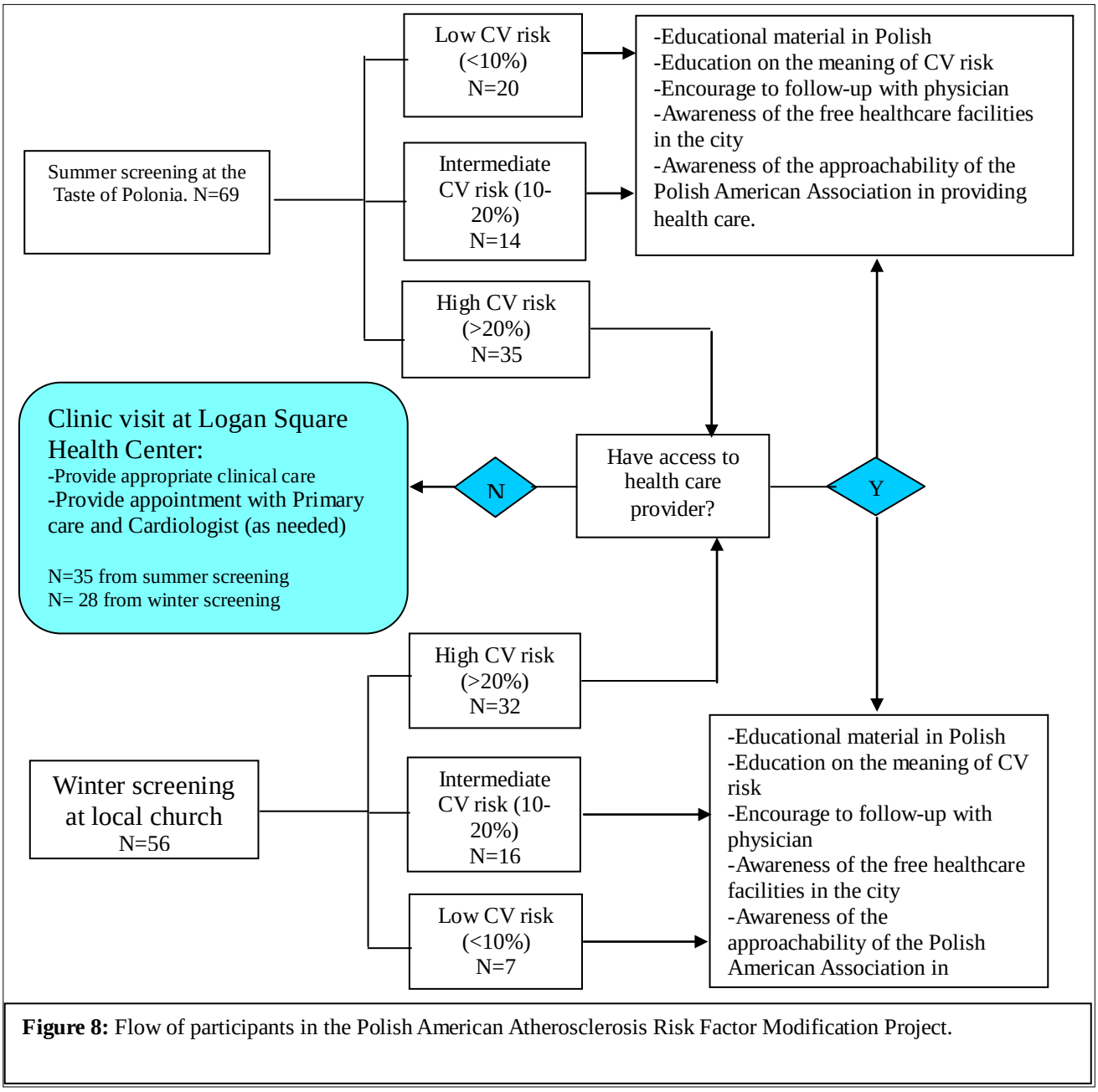


Figure 8: Flow of participants in the Polish American Atherosclerosis Risk Factor Modification Project.

69 individuals during the summer screening and 56 indiviudals during the winter sceeening were provided with cardiovascular risk assement. All high risk individuals from the summer screening (N=35) and 28 of the 32 (87%) high risk individuals from the winter screening were given follow-up appointments as they did not have any resources to seek medical care. Figure 8 displays the flow of individuals through the screening health fairs.

Of the total screened, 65 (52%) were females while all were white. All needed translation services making them non-proficient in english and most probably recent immigants. The distirbution of the collected risk factor variables in the screened population are shown in Table 1 and Figure 9.

N=125		AGE GROUP (YEARS)					
SMOKING	DIABETES	<35	35-44	45-54	55-64	65-74	>74
36 (29%)	14 (11%)	2(1.6%)	12(9.6%)	26(21%)	46(37%)	35(28%)	4(3.2%)

BODY MASS INDEX CATEGORIES				
15-20	21-25	26-30	30-40	>40
1 (<1%)	26 (21%)	54 (44%)	39 (31%)	4 (3%)

SYSTOLIC BLOOD PRESSURE CATEGORIES												
111-120	121-130	131-140	141-150	151-160	161-170	171-180	181-190	191-200	201-210	211-220	221-230	231-240
15	22	21	26	16	13	6	2	1	2	1	0	0

Table 1: Distribution of the risk factor variables in the screened population (N=125)

54% of the screened individuals had a systolic blood pressure >140 mm Hg while close to 78% were at least overweight according to the calculated body mass index. 68 individuals (54.4%) had >20% estimated predicted risk of a fatal and non-fatal adverse cardiovascular outcome in the next 5 years. (Table 2) (Figure 9)

PREDICTED 5 YEAR ADVERSE CV RISK	NUMBER OF INDIVIDUALS (PERCENTAGE) N=125
<5%	10 (8%)
5-10%	17 (13.6%)
10-20%	30 (24%)
20-30%	36 (28.8%)
>30%	32 (25.6%)

Table 2: Distribution of the various risk categories in the screened Polish population.

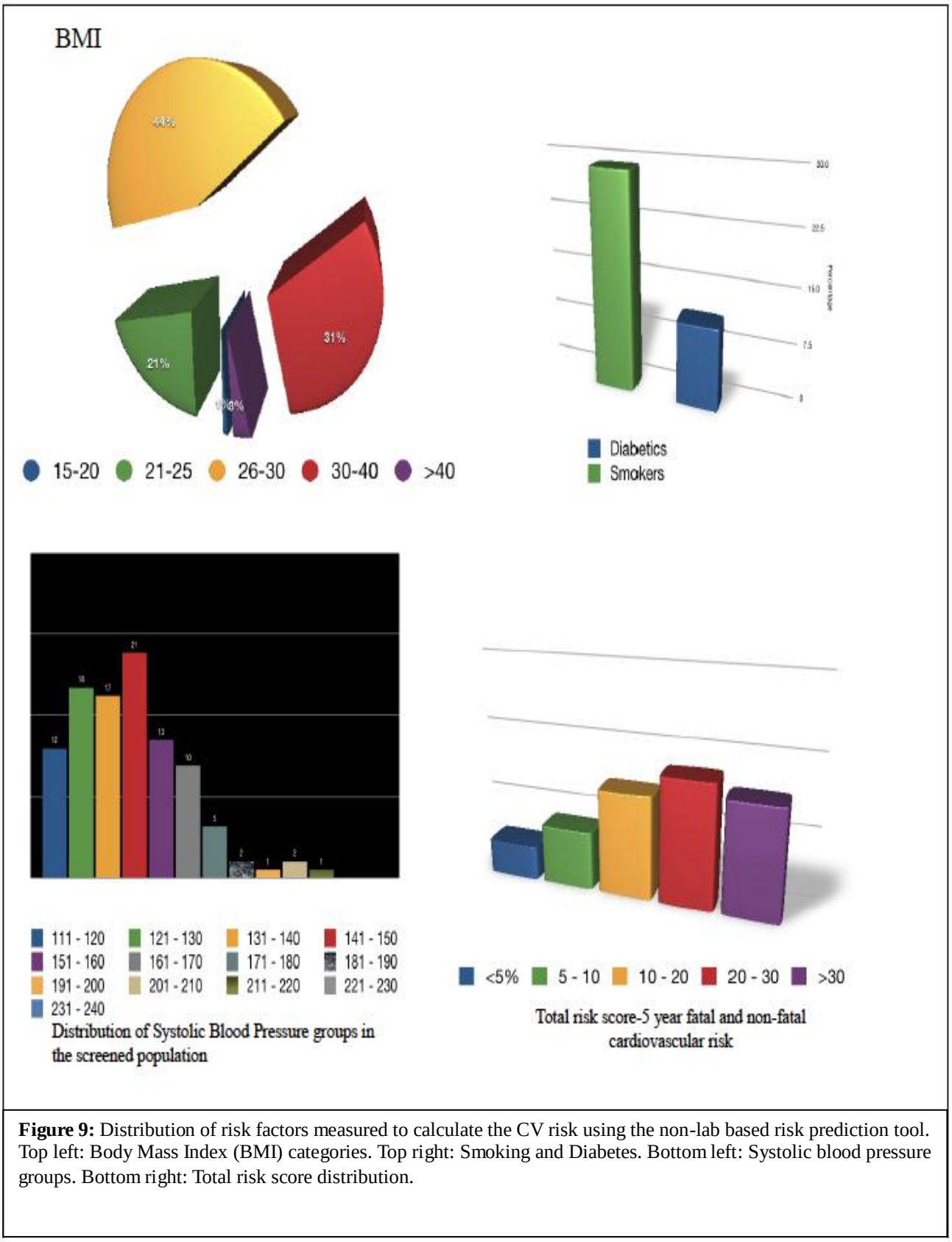


Figure 9: Distribution of risk factors measured to calculate the CV risk using the non-lab based risk prediction tool. Top left: Body Mass Index (BMI) categories. Top right: Smoking and Diabetes. Bottom left: Systolic blood pressure groups. Bottom right: Total risk score distribution.

	LOW AND INTERMEDIATE CV RISK (<20%) N=57	HIGH CV RISK (>20%) N=68	CHI SQUARE 2 TAILED TEST
Age >64	2 (3.5%)	37 (54%)	0.001
Male	22 (23%)	38(56%)	0.0003
BMI>25	7(12%)	60 (88%)	0.0001
SBP>140 mm Hg	19 (33%	48 (70%)	0.0001
Smoker	19 (33%)	17 (25%)	0.0647
Diabetes	0	14 (20%)	

Table 3: Comparison of the risk factor distribution between the high-risk group and the rest of the risk groups. CV=Cardiovascular. Risk percentage predicts 5-year fatal and non-fatal CV events

Individuals at a risk >20% had significantly higher prevalence of all risk factors except tobacco use when compared to the rest of the risk categories combined. (Table 3)

As of the date this thesis is being written, 34 patients have been seen in the follow-up clinic visits while 10 more had appointments scheduled. Data on 26 of them was available. (Table 4)

Average age (yrs)	56.8
Males	14 (53.8%)
Care at CCBH in the past	6 (23%)
ER visits to Stroger hospital since 1990	3(11.5%)
Primary care at CCBHS	0
SBP>140 at clinic visit	20(76.9%)
DBP>80 at clinic visit	18 (69.2%)
Median LDL(mg/dl)	134 (±31.5)
Medial HDL (mg/dl)	51.5 (±17)
Median TG (mg/dl)	159.5 (±74.9)
On ASA	6 (23%)
New medication added on first clinic visit	15(57.6%)
Diagnostic test ordered on first clinic visit	10(38.4%)
Follow-up with Cardiology provided	10(38.4%)

Table 4: Descriptive data of the patients followed-up at the Logan square health center.

Median cholesterol levels were only mildly elevated. While all of them were pre-qualified as

having high cardiovascular risk, only 23% were on aspirin. Though a minority (23%) had sought health care at the John.H.Stroger Jr. Hospital of Cook County in the last 10 years period, none had access to a primary care physician. Majority (57.6%) needed initiation of a new medication at the first visit. As none had lab tests performed prior to the first visit, it is safe to assume that majority might have needed anti-hypersensitive medication or aspirin.

A high cardiovascular risk (>20%) prevelance rate of 54.4% was found in the current study. In 2006, an estimated 62000 poles in the Chicago area were living >150% below the poverty line.. Assuming the same prevelance rate in this segment of the Polish community, it was estiimated that approximately 34,100 individuals will be at a >20% chance of having a fatal or non-fatal event in the next 5 years. Figure 10 shows the estimated event free survival over 5 years assuming an average

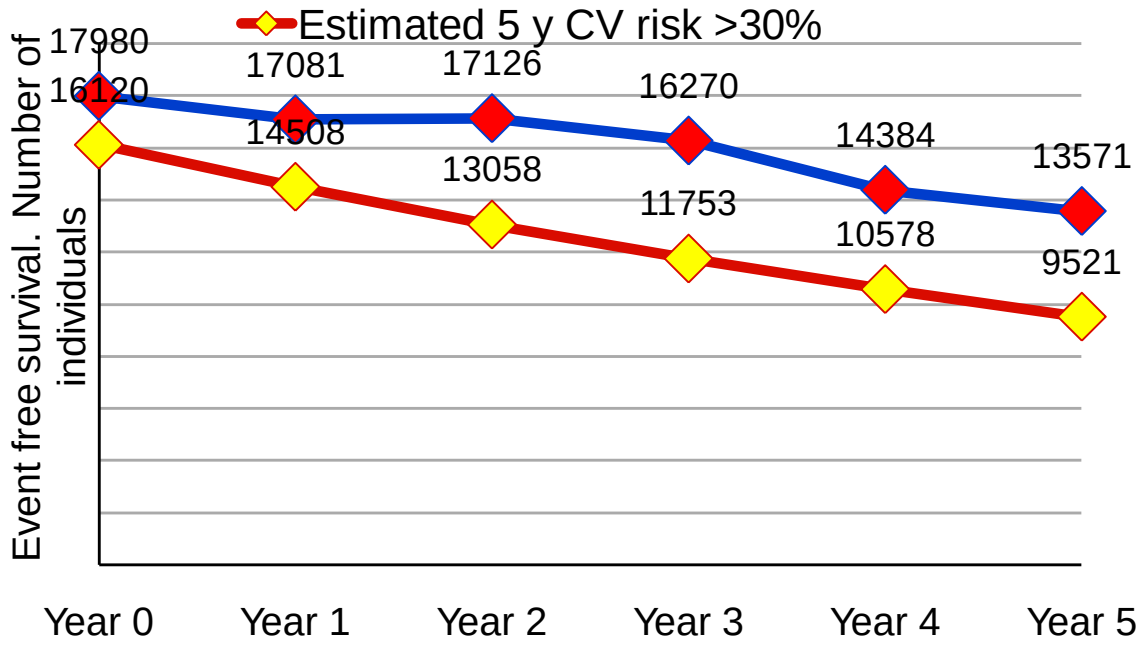


Figure 10: Projected number of individuals who will have an event free survival at the end of 5 years among the poorest segment of the Polish population. Such risk is presumed to be persistent in individuals as this population does not have easy access o health care. . A 5 year risk of 25 % was used for the group with 20-30% risk and 30% was used for >30% risk group. A steady event rate was assumed.

steady rate of events as described in the statistics section. By risk factor modification in the present, the

slope of this curve is expected to be made less steep.

FUTURE DIRECTION

As a bridge between the community and the health system has been built, current efforts are being directed towards consolidating sustainable solutions. Mediated by the author of this thesis, joint discussions are underway between the Polish American Association and Logan Square health center to initiate collaborative efforts in providing volunteers for translation services on a regular basis. Also, organizational structural changes in the clinic will accommodate appointment scheduling of Polish speaking patients on specific days when translation services will be available.

Health outreach workers from the Polish American Association are being trained to provide cardiovascular health screening utilizing the screening tool and the resources purchased for the POLAARIS project. The PAA will organize future health screening at least twice a year and refer individuals to the Logan Square health center. Efforts are ongoing to get the American Heart Association to publish online, the educational material created for the POLAARIS project. A website for the project (www.polaaris.org) as a portal for education and consolidation of available resources is under construction.

CHAPTER 4

DISCUSSION

Health systems in the United States face unique challenges in catering to the needs of diverse populations in the nation. The Institute of Medicine (IOM) document titled 'Unequal Treatments' recognized issues within the healthcare system and proposed various system changes to reshape the structure of health care delivery in order to provide equal standards for the people of the country irrespective of their race, color or creed. Most national data exploring disparities in the health of various populations have focused on ethnic and racial minorities. The definition of race is extremely variable across the globe. In the United States, the classification of individuals into racial categories like White, Black, Hispanic, non-Hispanic white, Asian, etc. provides a practical approach into census documentation and serves as a beginning point to address any disparities. Yet, with respect to diversity of the populations, using the current definition of race would make an assumption of cultural and lingual homogeneity within the racial boundaries. The Polish population in the Chicago area would meet the description of the White race; yet have unique language and cultural barriers different from the white population. The current community project identified the unique needs of the polish population in the Chicago area and portrays the need for health systems to generate diversity data specific to the population served irrespective of the agenda of national and state systems.

Various models [75-78] have been proposed to study the health system in order to improve access to health care for minority populations. Bierman et al [76] described that barriers to providing equitable health care occurs on three levels: 1) Access to the health care system (e.g.: trouble getting care, delay in accessing care due to cost and transportation issues) 2) Structural barriers within the system (e.g.: difficulty getting appointment, referrals to specialists) and 3) The ability of the provider to address patients needs (e.g.: cultural competency, awareness of patients conditions and functional limitations). Using this model priority issues concerning health care to the uninsured Polish individuals were identified in the POLAARIS project. The most important hurdle identified with input from the

community organization and local clinic was the language barrier. While distance to the county hospital was also an issue, it was considered a minor one.

Language is an inherent barrier to provide effective health care to non-English speaking population in the United States. Multiple studies[78, 79] have shown that lack of effective communication with non-English speaking patients leads to patient dissatisfaction, non-compliance and lower quality of life. To overcome this barrier, IOM recommends the utilization of language interpretation services but does not address the limited availability of such resources. Moreover, individual health systems might cater to population pockets of unique lingual needs in magnitudes that might not make it financially tangible to hire language interpretation services for daily availability. The collaboration established between the health system and the community organization in the POLAARIS project shows an avenue that can solve this limitation of resources. Community organizations working with minorities are great resources to provide services to these populations. Qualified individuals can be sought from the community to provide translation services. It has been well established that partnerships between health care systems and community organizations have a positive impact on the outcomes of interventions providing health care services to minorities. [80-83]

CULTURAL COMPETENCY:

The office of Minority Health at the U.S. Department of Health and Human Services (DHHS) defines cultural and linguistic competence as a set of congruent behaviors, attitudes, and policies that come together in a system, agency, or among professionals that enables effective work in cross-cultural situations. 'Culture' refers to integrated patterns of human behavior that include language, thoughts, communications, actions, customs, beliefs, values, and institutions of racial, ethnic, religious, or social groups. 'Competence' implies having the capacity to function effectively as an individual and

an organization within the context of the cultural beliefs, behaviors, and needs presented by consumers and their communities.

1. Health care organizations should ensure that patients/consumers receive from all staff members' effective, understandable, and respectful care that is provided in a manner compatible with their cultural health beliefs and practices and preferred language
2. Health care organizations should implement strategies to recruit, retain, and promote at all levels of the organization a diverse staff and leadership that are representative of the demographic characteristics of the service area.
3. Health care organizations should ensure that staff at all levels and across all disciplines receive ongoing education and training in culturally and linguistically appropriate service delivery.
4. Health care organizations must offer and provide language assistance services, including bilingual staff and interpreter services, at no cost to each patient/consumer with limited English proficiency at all points of contact, in a timely manner during all hours of operation.
5. Health care organizations must provide to patients/consumers in their preferred language both verbal offers and written notices informing them of their right to receive language assistance services.
6. Health care organizations must assure the competence of language assistance provided to limited English proficient patients/consumers by interpreters and bilingual staff. Family and friends should not be used to provide interpretation services (except on request by the patient/consumer).
7. Health care organizations must make available easily understood patient-related materials and post signage in the languages of the commonly encountered groups and/or groups represented in the service area.
8. Health care organizations should develop, implement, and promote a written strategic plan that outlines clear goals, policies, operational plans, and management accountability/oversight mechanisms to provide culturally and linguistically appropriate services.
9. Health care organizations should conduct initial and ongoing organizational self-assessments of CLAS-related activities and are encouraged to integrate cultural and linguistic competence-related measures into their internal audits, performance improvement programs, patient satisfaction assessments, and outcomes-based evaluations.
10. Health care organizations should ensure that data on the individual patient's/consumer's race, ethnicity, and spoken and written language are collected in health records, integrated into the organization's management information systems, and periodically updated.
11. Health care organizations should maintain a current demographic, cultural, and epidemiological profile of the community as well as a needs assessment to accurately plan for and implement services that respond to the cultural and linguistic characteristics of the service area.
12. Health care organizations should develop participatory, collaborative partnerships with communities and utilize a variety of formal and informal mechanisms to facilitate community and patient/consumer involvement in designing and implementing CLAS-related activities.
13. Health care organizations should ensure that conflict and grievance resolution processes are culturally and linguistically sensitive and capable of identifying, preventing, and resolving cross-cultural conflicts or complaints by patients/consumers.
14. Health care organizations are encouraged to regularly make available to the public information about their progress and successful innovations in implementing the CLAS standards and to provide public notice in their communities about the availability of this information.

Figure 11: The 14 National Standards set by the U.S Department of Health and Human Services Office of Minority Health document- *National Standards for Culturally and Linguistically appropriate Services in Health care*.CLAS: Culturally and Linguistically Appropriate Services

In 2001, National standards[84] were published to help health care organizations provide culturally and linguistically appropriate health care to minorities. The document lists 14 standards (Figure 11) under three themes: 1) Culturally competent care, 2) Language access services and 3)

Organizational supports for cultural competence.

Though these standards provide a good framework to guide the implementation of equal care to all minorities, a commitment of the organizational leadership in ensuring quality care needs to be a crucial element for success. In the current project, the Polish community has been a known linguistically unique minority for many years in the Chicago area. Yet there were many lacunae in the health system that hindered provision of the best standard of care. Though translation services were available through the on site translators, it was confined to only one institution of the entire health system, which was not easily accessible for the Polish community. Moreover, there have been no internal audits on the adequacy of the language services available. Verbal conversations and personal experience has shown that the translators are short staffed.

ORGANIZATIONAL RESTRUCTURING

In a similar fashion to recommending utilization of language interpretation services, the IOM also recommended increasing the proportion of underrepresented minorities in the health care workforce. Such a solution, even with a deliberate agenda might not be consistently feasible in every aspect of a health care system. An organized effort to utilize the resources of the limited polish speaking health care workers was attempted with success in the POLAARIS project. Health care personnel of polish decent at the John. H. Stroger Jr. Hospital of Cook County extended their services beyond their line of duty to provide care to the needy. There were minor and easy schedule changes that needed to be done to accommodate the needs of the POLAARIS project. This might be a feasible option to identify personnel of similar ethnic and language background as the community in context and organize their services without affecting their routine. Patient compliance and follow-up are way better when individuals and providers are matched with the common language, culture and race.

A MODEL FOR SPECIALITY PREVENTIVE CLINICS

By executing a preventive cardiology clinic, we were able to test run the idea of utilizing resources remote from the hospital in order to make it easy for the community organization volunteers to provide their services. The medical community holds an expectation from the primary care physicians and public health personnel to provide primary preventive services. With advancements in specialty care, Cardiologists spend more time providing care to those with heart disease and at best implement secondary preventive measures. As performed in the POLAARIS project, an initiative where the primary care clinics can team with cardiologists might bring the best of the screening and treatment options for the patients. Based on prior experience at John.H. Stroger Jr. Hospital of Cook County, it was assumed that there was a lack of continuum of care in relation to cardiovascular disease process. Chronic diseases develop over a period of many years and the continuum of the disease process needs to be identified before clinical manifestations in order to provide interventions for the process to regress. It is very important for preventive medicine experts to have a perspective of such a continuum of care for a disease. (Figure 12) The specialty and primary care collaboration can also be effective for better implementation of secondary prevention measures.

A CRITICAL ANALYSIS OF THE SUCCESS AND SHORTCOMINGS OF THE POLAARIS PROJECT:

The POLAARIS project was initiated with a vision of providing culturally effective care for the Polish immigrants in Chicago. The major success of the project was in the fact that the gap between the community organization and the health facility was bridged. In order to create such collaborative networking, a strategy to provide preventive care for cardiovascular disease was used. A low number of individuals were screened. During initial planning of the project, it was estimated that around 400-500 individuals could be provided with screening. Such an objective was scaled down in order to be able to

provide with proper follow-up care. Just screening and not being able to provide access to a physician would have subjected individuals to more anxiety.

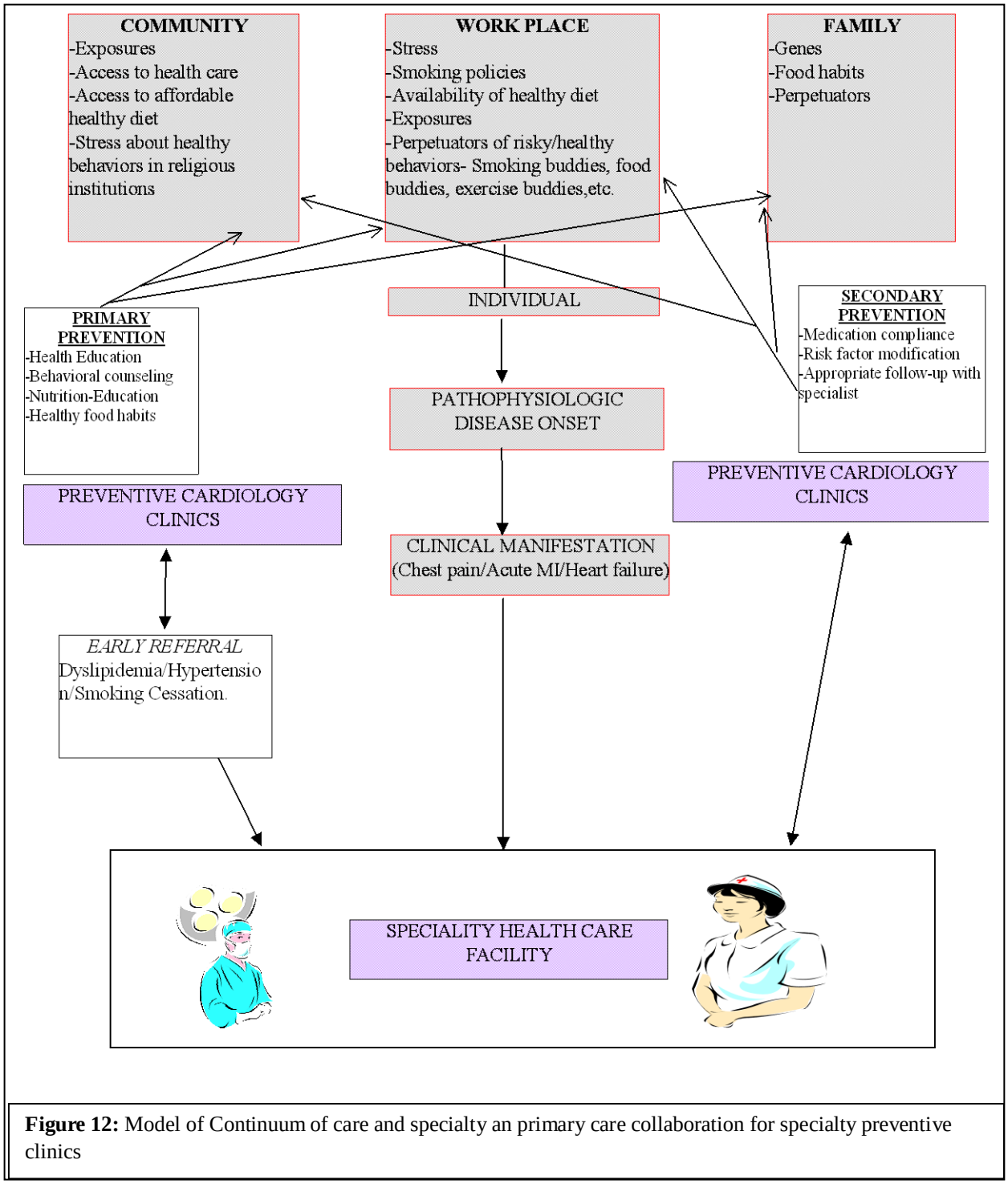


Figure 12: Model of Continuum of care and specialty an primary care collaboration for specialty preventive clinics

All the primary specific objectives were met. Health screening was provided effectively with appropriate follow-up at an accessible health facility. The magnitude of the health screening was deliberately reduced. Educational material were created in Polish for the first time in the United Sates and distributed to the community. Such material has been stocked up at the Logan Square health center and the Polish American Association. Current effort is expected to get American Heart Association provide such material online on their website. Awareness of the availability of health services was presumably increased with television and radio shows about the project. Though this was one of the aims, it was not planned to measure the awareness. Moreover, increasing awareness of the availability of the specific free health facility at the Logan Square Health center was thought to be detrimental to providing care in a facility that was not prepared to handle any increase in influx of Polish patients.

One of the objectives was to provide culturally effective care. At the beginning of the project it was felt that the prevailing concept of providing culturally appropriate and cultural sensitive care are minimalist approaches for providing effective care. It was anticipated that by integrating appropriate assessments of a culture that are relevant to health of individuals, an intervention that is culturally "effective" can be created. The POLAARIS project fell short in many ways in doing so. The idea of culturally effective care sounds idealistic and might be extremely difficult to achieve, measure and prove effective. Such an idea was proposed in order to portray the need to make efforts towards understanding a culture better before providing care tailored towards it. Another major shortcoming of the project is in the idea of providing sustainable change. At present the leadership of the Logan Square health center and the Polish American Association seem committed towards continuing efforts to improve access to health care of the Polish immigrants in Chicago. Current commitment might not guarantee lasting commitments as the current involvement of these organizations has been confined towards extending cooperation than being proactive. The primary author of this thesis has done most of the groundwork, planning and execution.

LIMITATIONS:

There are many limitations of this project. Language barrier was presumed to be the most important limitation to access to health care for the Polish population. There might be many other attributes of the Polish culture specific to cardiovascular health that might limit improving the health of this population in spite of breaking the language barrier. Polish speaking physicians provided patient care during the project clinics under the assumption that they understood the cultural attributes of health behavior of the Polish immigrant patients. There was no specific attention provided to evaluate issues specific to immigrant health. The physicians, though Polish in origin, might not be able to relate to the issues of the working class Polish immigrants. There was also no specific measure of patient satisfaction and cultural appropriateness of the care provided in the clinics.

The crux of the POLAARIS initiative was based on the premise that Poles were different when compared to the American Whites. Yet, the non-lab based screening tool used in the POLAARIS project was validated using the Framingham population. Cardiovascular risk tools validated in Europe are available, but the above-mentioned screening instrument was used because of the low cost involved in screening. Single blood pressure measurements were used to calculate risk. The chance of a falsely high reading might have been substantial in the summer screening as it was in a setting of a food festival and individuals were consuming foods with probably high sodium content. This in turn could have caused a high blood pressure. Irrespective of the error in measurement, all individuals who were identified as high risk needed access to a physician.

The estimated data calculated to estimate the projected risk might not be an accurate estimate. In order to minimize exaggeration of the statistic the denominator was confined to only the poorest of the population from the Polish census (>150% below poverty line). Though the census statistic used was from 2006, the current state of economy would only make the estimate a conservative one.

The no-show rate of individuals given follow-up at the clinic was high. Of the 63 individuals given appointments only 44 have and will be seen at the POLAARIS clinics at the Logan square health center. There has not been any effort made towards identifying the reasons for the no-shows. Future efforts should be directed towards getting feedback from the patients on their perceptions of the clinic visits.

CONCLUSION

The POLAARIS project is the first of its kind as an initiative to improve access to care to the Polish population in Chicago. In the current project, by mobilizing scattered resources within the health care system and collaborating with a community organization barriers were identified and at least partially resolved.

It is important to identify individuals with unique cultural and linguistic needs through a vigilant system incorporated within the organizational structure of health care systems. Once identified, partnering with established community organizations is a feasible option to meet most needs of any planned intervention to improve health care to minority populations.

APPENDICES

Appendix A: **POSTER CAMPAIGN TO RECRUIT VOLUNTEERS FOR THE POLAARIS PROJECT**

Appendix B: **GRANT APPROVAL LETTER FROM AMERICAN HEART ASSOCIATION**

American Heart Association. | American Stroke Association.
Learn and Live.

June 29, 2009
Arvind Bhimarai
John H. Stroger Hospital of Cook County
Chicago IL 60612

Dear Arvind,
Congratulations! Your project entitled **Polish American Atherosclerosis Risk Factor Modification Project** that you submitted for an American Heart Association Community Action Grant has been selected for funding. This is quite an achievement, since we received 150 applications and were only able to fund 28 grants.

The award is scheduled to begin July 1, 2009 and end June 30, 2010. A check in the amount of **$4,000.00** will be mailed to you within the next few weeks. This is a change in the amount you requested.

Please let us know if you will be able to implement your project and meet its goals at this funding level. After confirming that you will be able to proceed with the project with the funding offered by the American Heart Association, please sign and return the attached form by **July 6th,** acknowledging acceptance of your award, providing contact information for your payment and providing a brief description of your project. Also, attach a copy of your W-9 (a blank one is attached if needed).

If you develop any print materials, please list the American Heart Association as a sponsor of the project.

The following information will be required 30 days after the conclusion of the funding period:

1. A **financial statement** listing expenses for the project. In the event that any of the money received was unexpended due to lower expenses, etc., the unexpended money will need to be returned to the American Heart Association.

2. A **project report**. It should include activities completed, number of people reached, objectives met or not met, a summary of the evaluation, future plans, copies of media coverage, and a copy of any materials developed.

3. In addition, should the focus of the project change during the funding year or if you have any questions, please contact Lori Hall at 248-936-5819 and lori.hall@heart.org or Liz Andrews at 312-476-6604 and liz.andrews@heart.org.

To order American Heart Association/American Stroke Association materials for your project, please contact Krames at 1-800-617-8194 or www.krames.com/aha Krames, a recognized leader in patient education material, is the sole distributor of AHA/ASA educational materials. You may also order our Go Red For Women materials at www.shopgored.org.

Good luck with the implementation of your project. Thank you for your efforts to build healthier lives, free of cardiovascular diseases and stroke!
Sincerely,

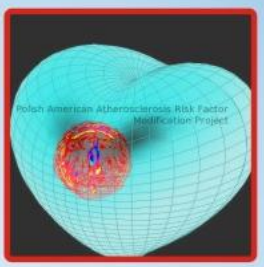
David Cooke
David Cooke, M.D.
President
American Heart Association, Midwest Affiliate

Appendix C**: SCREENING TOOL FOR MEN USED IN THE POLAARIS PROJECT**

POLISH AMERICAN ATHEROSCLEROSIS RISK FACTOR MODIFICATION PROJECT (POLAARIS)

OPTIONAL

RISK CALCULATOR FOR MEN



Risk prediction chart for cardiovascular disease using non-laboratory-based measures (men)

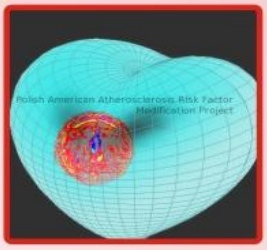
Projekt sponsorownay przez:
American Heart Association Mid-West affiliate Community Action Grant.

Appendix D: **SCREENING TOOL FOR WOMEN USED IN THE POLAARIS PROJECT**

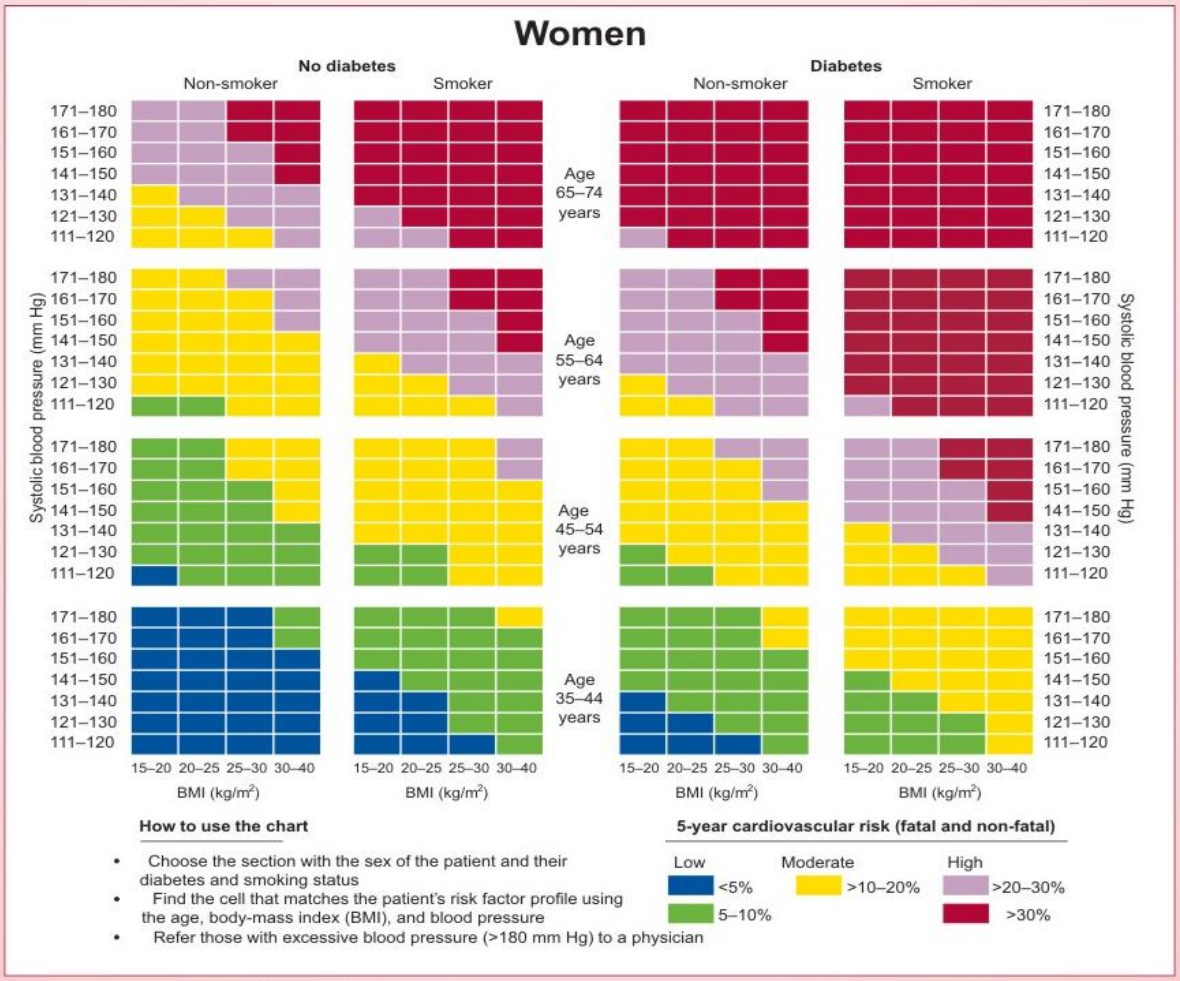
POLISH AMERICAN ATHEROSCLEROSIS RISK FACTOR MODIFICATION PROJECT (POLAARIS)

OPTIONAL

RISK CALCULATOR FOR WOMEN



Women



How to use the chart

- Choose the section with the sex of the patient and their diabetes and smoking status
- Find the cell that matches the patient's risk factor profile using the age, body-mass index (BMI), and blood pressure
- Refer those with excessive blood pressure (>180 mm Hg) to a physician

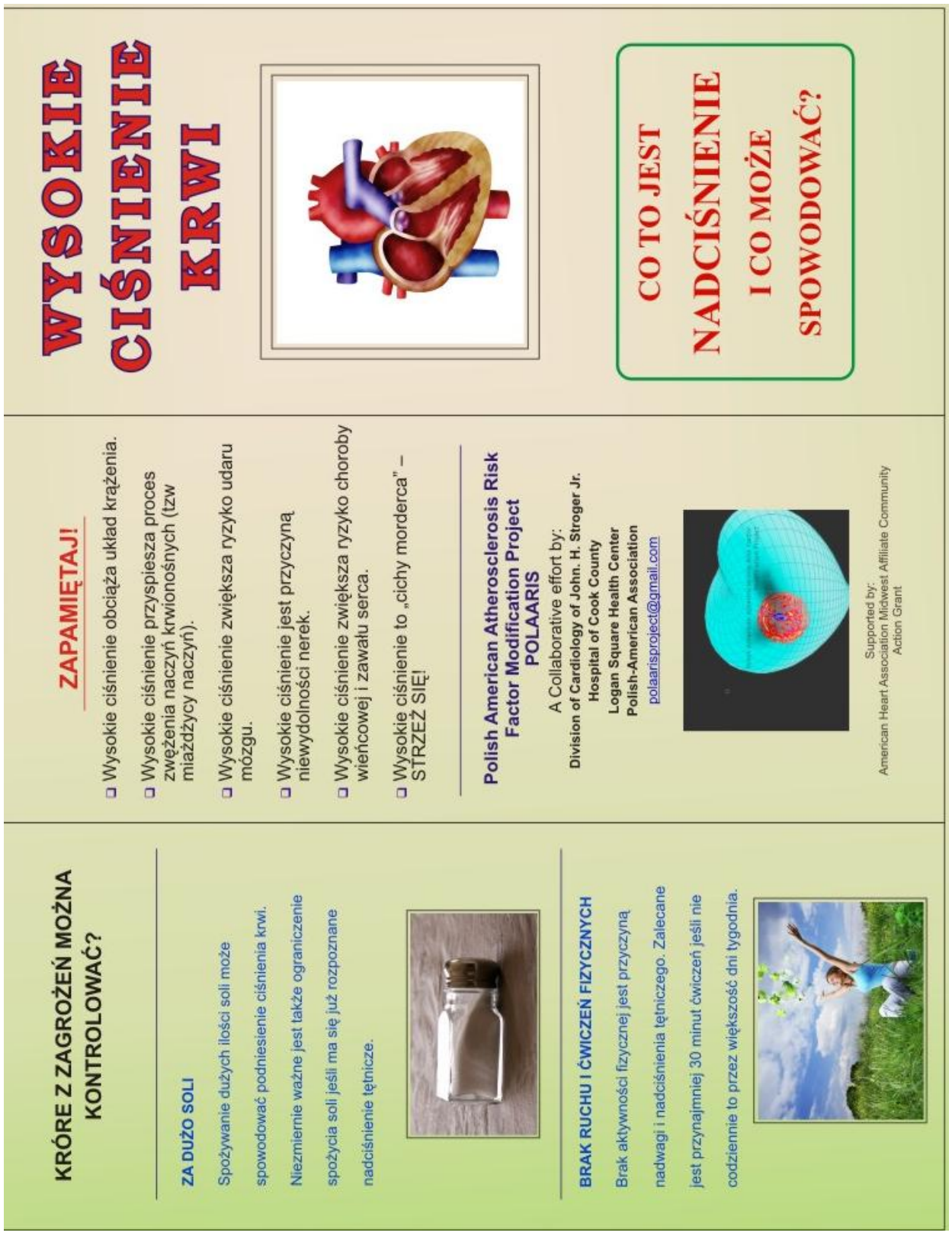
5-year cardiovascular risk (fatal and non-fatal)

Low	Moderate	High
<5%	>10–20%	>20–30%
5–10%		>30%

Risk prediction chart for cardiovascular disease using non-laboratory-based measures (women)

Projekt sponsorownay przez:
American Heart Association Mid-West affiliate Community Action Grant.

Appendix E1:**OUTSIDE OF THE PAMPHLET ON HYPERTENSION**



Appendix E2: **INSIDE OF THE HYPERTENSION PAMPHLET**

Co to jest ciśnienie krwi?

W czasie mierzenia ciśnienia krwi uzyskujemy dwie liczby, pierwsza z nich to tzw. ciśnienie skurczowe (wskazuje ono siłę skurczu serca), druga niższa wartość to tzw. ciśnienie rozkurczowe.

Rodzaj ciśnienia krwi	SKURCZOWE (mm Hg)		ROZKURCZOWE (mm Hg)
Normalne	poniżej 120	i	mniej niż 80
Stan przed nadciśnieniowy	120-139	lub	80-89
Nadciśnienie tętnicze I stopnia	140-159	lub	90-99
Nadciśnienie tętnicze II stopnia	160 lub wyżej	lub	100 lub wyżej

Kontroluj swoje ciśnienie krwi, jeżeli jest ciągle podwyższone – prawdopodobnie masz już chorobę nadciśnieniową. Jeżeli jest nieznacznie podniesione, możesz je obniżyć poprzez zmiany w twoim stylu życia (ćwiczenia, dieta, walka z nadwagą). Jednak znacznie podwyższone wartości ciśnienia poza odpowiednim stylem życia wymagają stosowania właściwych leków. Około 90-95% ludzi z nadciśnieniem nie ma żadnych niepokojących objawów, stąd nadciśnienie jest nazywane „cichym zabójcą".

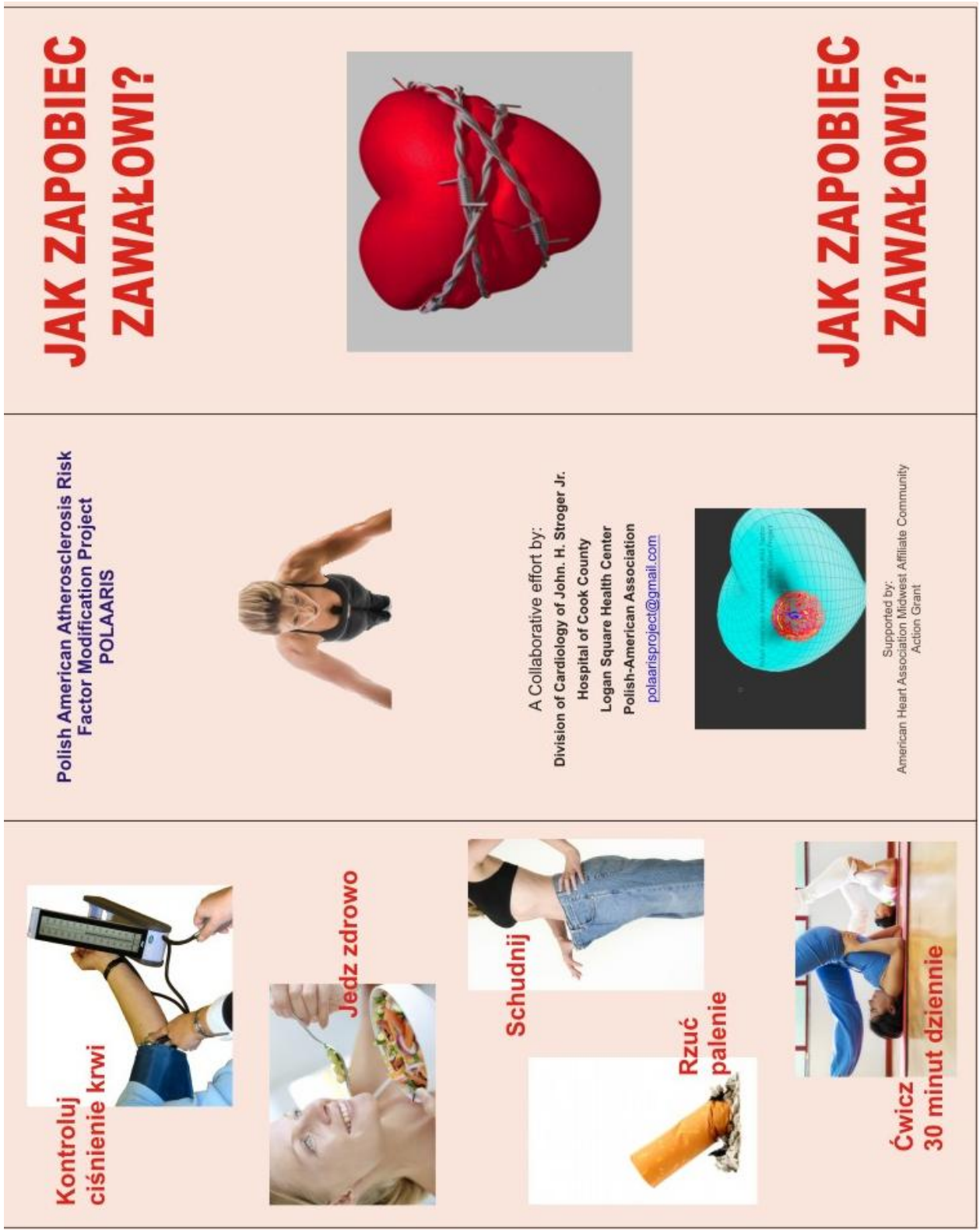
Co zwiększa ryzyko wystąpienia nadciśnienia tętniczego?

OTYŁOŚĆ
Jeśli twój wskaźnik masy ciała (BMI) jest wyższy niż 30kg/m2 to ryzyko wystąpienia nadciśnienia tętniczego jest znacznie podwyższone. Wzór do obliczenia BMI

$$BMI = \frac{\text{Waga w kilogramach}}{(\text{Wzrost w metrach})^2}$$

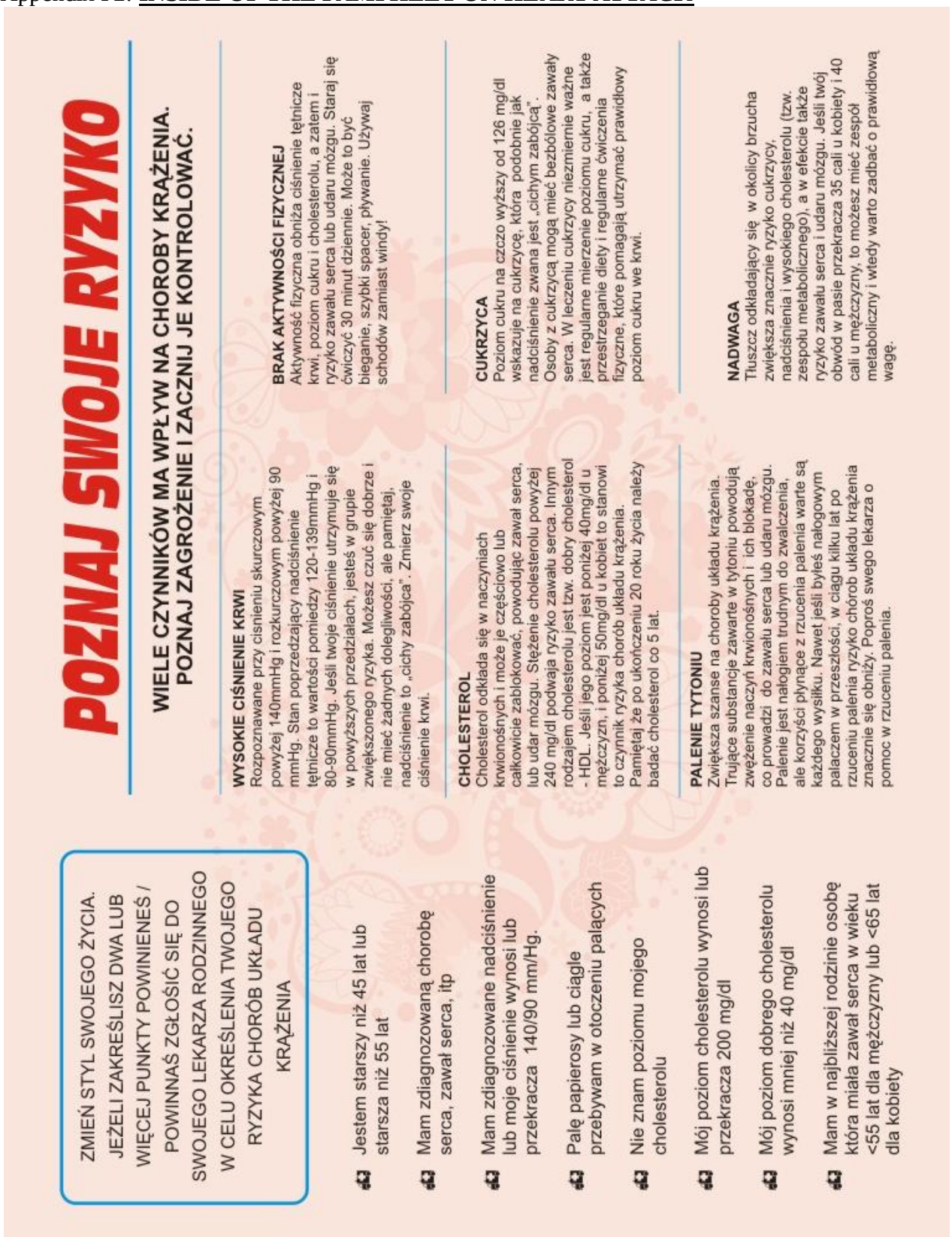
ALKOHOL
Częste picie alkoholu powoduje podwyższenie ciśnienia krwi, a także trwałe uszkodzenie wątroby.

STRESS
Stress jest dobrze znanym i obecnie powszechnie obecnym czynnikiem ryzyka chorób układu krążenia. Wyjazd za granice lub do innego miasta, nowa praca, rozłaka z rodzina moga byc bardzo silnymi czynnikami stresogennymi.



Appendix F1:**OUTSIDE OF THE PAMPHLET ON HEART ATTACK**

Appendix F2: **INSIDE OF THE PAMPHLET ON HEART ATTACK**



Appendix G1: **OUTSIDE OF PAMPHLET ON CHOLESTEROL**

TRÓJGLICERYDY

Jest to rodzaj tłuszczy występujących we krwi. Wiele osób z chorobami serca i cukrzycą ma wysoki poziom trójglicerydów. Według badań ich poziom powyżej 150 mg/dl zwiększa ryzyko zawału serca i udaru mózgu. Osoby takie powinny ograniczyć spożycie węglowodanów i tłuszczów.

Polish American Atherosclerosis Risk Factor Modification Project
POLAARIS

A Collaborative effort by:
Division of Cardiology of John. H. Stroger Jr.
Hospital of Cook County
Logan Square Health Center
Polish-American Association
polaarisproject@gmail.com

Supported by:
American Heart Association Midwest Affiliate Community Action Grant

CHOLESTEROL

CHOLESTEROL

Twój organizm potrzebuje cholesterolu do prawidłowego funkcjonowania, ale jego nadmiar powoduje stopniowe odkładanie się cholesterolu w ścianach naczyń doprowadzając do zwężenia ich światła, a nawet całkowitej blokady.

- Każdy po ukończeniu 20 roku życia powinien kontrolować poziom cholesterolu co 5 lat.
- Zbadaj swój poziom lipidów - "Lipid panel" lub "Lipoprotein profile".
- Jeżeli jesteś w grupie zwiększonego ryzyka chorób serca, lub masz podwyższony poziom cholesterolu, musisz częściej poddawać się testom.

DOBRA i ZŁA STRONA CHOLESTEROLU

CAŁKOWITY CHOLESTEROL

Obniżenie poziomu cholesterolu zapobiega zawałowi serca i udarom mózgu. Optymalny poziom cholesterolu wynosi poniżej 200mg/dl. Odżywiając się zdrowo należy spożywać pokarmy z niską zawartością tłuszczy nasyconych i nienasyconych, oraz cholesterolu. Poziom cholesterolu należy badać co 5 lat.

Jeżeli poziom twojego cholesterolu wynosi powyżej 240 mg/dl, to jest to istotny czynnik ryzyka chrób układu krążenia i należy zbadać jego frakcje: poziom LDL i HDL czyli poziom złego i dobrego cholesterolu.

DOBRY CHOLESTEROL -LIPOPROTEINA WYSOKIEJ GĘSTOŚCI (HDL):

Ten typ cholesterolu jest potrzebny do usuwania złogów złego cholesterolu z naczyń krwionośnych i przenoszenia go do wątroby. Jest niewiele leków zwiększających poziom dobrego cholesterolu. Poziom HDL powyżej 60mg/dl jest powszechnie uważany za chroniący przed chorobami serca.

Aby zwiększyć poziom dobrego cholesterolu należy:

- Ćwiczyc minimum 30 minut dziennie
- Utrzymywać prawidlową wagę ciała
- Unikać diet z bardzo niska zawartością tłuszczu – ponizej 15% ogółu kalorii.
- Przestać palić.

ZŁY CHOLESTEROL

LIPOPROTEINA NISKIEJ GĘSTOŚCI (LDL):

Ten typ cholesterolu powoduje zwężenia naczyń krwionośnych doprowadzając do zawału serca, udaru mózgu i zwężenia naczyń obwodowych.

Jaki jest optymalny poziom LDL?	
Do 160 mg/dl	Osoby bez choroby wieńcowej serca, zwężeń naczyń obwodowych lub cukrzycy
130-100 mg/dl	Osoby z jednym lub dwoma czynnikami ryzyka
Poniżej 70 mg/dl	Osoby z chorobą wieńcową, zwężeniami naczyń obwodowych lub cukrzycą

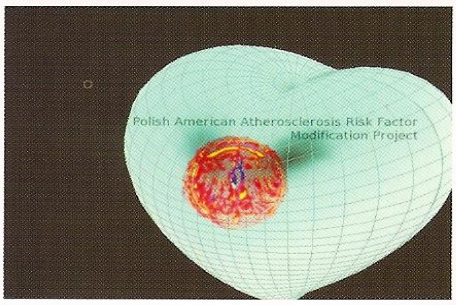
Jakie są czynniki ryzyka chorób układu krążenia?

- Wiek: dla mężczyzn powyżej 45 lat i powyżej 55 lat dla kobiet.
- Choroby serca w rodzinie; przed 55 rokiem życia w przypadku ojca lub brata, a przed 65 rokiem życia w przypadku matki lub siostry.
- Poziom HDL (dobry cholesterol) poniżej 40mg/dl
- Ciśnienie powyżej 140/90mmHg lub rozpoznane nadciśnienie tętnicze
- Cukrzyca
- Palenie tytoniu tak czynne jak i bierne

Appendix H: **PHOTOGRAPHS FROM THE SUMMER SCREENING AT THE TASTE OF POLONIA**

Appendix I: **PHOTOGRAPHS FROM THE WINTER SCREENING AT A LOCAL COMMUNITY CHURCH**

Appendix J: **APPOINTMENT CARD FOR FOLLOW-UP CARE AT THE LOGAN SQUARE HEALTH CENTER: FRONT AND BACK**



POLISH AMERICAN ATHEROSCLEROSIS RISK FACTOR MODIFICATION

Proszę pamiętać, że w klinice Logan Square Health Center przed wizytą lekarską zostanie sprawdzone czy Pani/Pan kwalifikuje się na bezpłatną wizytę lekrską. Podczas tej wizyty i ewentualnych następnych wizyt ocenimy jedynie poziom ryzyka chorób układu krążenia. Jeżeli potrzebuje Pani/Pan lekarza rodzinnego prosimy o zgłoszenie tego podczas wizyty. Lekarze z kliniki Logan Square Health Center nie są odpowiedzialni za Państwa rutynowe badania lekarskie.

Projekt sponsorownay przez:
American Heart Association Mid-West affiliate Community Action Grant.
Pytania prosimy kierować pod adres: polaarisproject@gmail.com

POLISH AMERICAN ATHEROSCLEROSIS RISK FACTOR MODIFICATION PROJECT

Ta liczba reprezentuje twoje ryzyko zawału serca / udaru mózgu / niewydolności krążenia / stentowania naczyń wieńcowych / operacji bypasów lub śmierci w ciągu najbliższych 5 lat

0-10% Niskie Ryzyko
11-20% Średnie Ryzyko
Powyżej 20% Wysokie Ryzyko

Jeśli Twoje RYZYKO jest wyższe niż 10% skonsultuj sie z lekarzem.

Jeśli nie masz lekarza rodzinnego lub jeśli nie masz ubezpieczenia zdrowotnego możesz zobaczyć sie z lekarzem:

Data:_____ Godzina:_____

Adres kliniki: Logan Square Health Center
2840 W. Fullerton w Chicago, IL 60647.

Appendix K: **VARIABLE LIST FROM THE DATA EXTACTION INSTRUMENT FOR THE PATIENTS WHO WERE FOLLOWED UP AT THE LOGAN SQUARE HEALTH CENTER**

Last name
First name
MRN
Date of first visit at Logan square health center
Gender
Age
Did patient seek care at John.H. Stroger Jr. Hospital since 1990: Y/N
Does patient have a Primary care physician at CCBHS: Y/N
Number of ER visits in the last year
Insurance status: Self pay/Medicare/Illinois Medicaid/Bluecross-Blueshied/Other_____
Systolic blood pressure at clinic visit
Diastolic blood pressure
Heart rate
Smoking status: Smoker/ Non-smoker
No. of Cigarettes:
Alcohol consumption: None/Occasional
No. of drinks
Past medical history of Hypertension: Y/N
Past medical history of Diabetes Mellitus: Y/N
Past medical history of Dyslipidemia: Y/N
Past medical history of Coronary artery disease: Y/N
Past medical history of Percutaneous Coronary Intervention: Y/N
Past medical history of CABG: Y/N
Other Past medical history: Y/N

Laboratory values
Total Cholesterol
Low Density Lipoprotein
High Density Lipoprtein
Triglycerides
Creatinine
Fasting Glucose
HBA1c

Medications patient taking prior to visit:
ASA: Y/N
Plavix: Y/N
ACE inhibitor: Y/N
Beta blocker: Y/N
Statin : Y/N
Other antilipids
Other medications

New Medication started: Y/N
Medication started
Diagnostic test ordered: Y/N
Indication
Test results
Cardiology Followup: Y/N
General Medicine Clinic f/u : Y/N

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