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## Pharmacists' Knowledge of Social Determinants of Health in Post-Graduate Pharmacy Residency Programs

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Pharmacists' Knowledge of Social Determinants of Health in Post-Graduate Pharmacy  
Residency Programs

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### Abstract

**Background:** Clinical pharmacists and their training programs can play a key role in helping to address social determinants of health (SDoH) by transforming healthcare beyond the traditional clinical approaches. Pharmacists' knowledge of SDoH in post-graduate residency programs are key skills necessary for creating an impact in healthcare outcomes.

**Purpose:** The purpose of this project was to assess U.S. Department of Veterans Affairs (VA) post-graduate residency program directors' and residents' knowledge about SDoH.

**Methods:** An IRB exempt questionnaire was created via Survey Monkey (™) and administered to postgraduate pharmacy residents ( $N = 618$ ) and residency program directors (RPDs) ( $N = 235$ ) employed by VA Medical Centers.

**Results:** Sixteen percent ( $n = 100$  of 618) of pharmacy residents and 24% ( $n = 58$  of 235) of RPDs completed the survey. Population health was part of didactic work in pharmacy school for 46% of residents and 8% of RPDs. Nine percent (9%) of residents and 7% of RPDs were very familiar with Healthy People 2020. One percent (1%) of residents and 4% of RPDs had training in Healthy People 2020 in their residency program. None of the residents and only 4% of responding RPDs asked patients about food insecurity, a critical social determinant of health.

**Discussion:** Pharmacy Residency training and RPD's experience with SDoH is limited.

Residency Programs should expand curriculum and incorporate training to address SDoH (such as food insecurity) in chronic care management.

*Keywords:* social determinants of health, pharmacy residency education, pharmacy practice, veterans affairs

Pharmacists' Knowledge of Social Determinants of Health in Post-Graduate Pharmacy  
Residency Programs

The World Health Organization (WHO, 2016) defines social determinants of health as “conditions in which people are born, work, and grow old, and the power and resources that shape these daily living conditions” (page 1). People with poor quality of education, decreased social support, unstable employment and housing, and decreased access to preventive services generally have less healthy lives. The Centers for Disease Control and Prevention (CDC, 2017) recognizes the importance of social determinants of health (SDoH) to the overall health of populations across the United States (U.S.). The CDC’s programs addressing SDoH work in conjunction with communities and are embedded across various sectors such as housing, transportation, and education to reduce disparities (CDC, 2016). Some programming from the CDC that address SDoH are the Childhood Lead Poisoning Prevention Program, the Partnerships to Improve Community Health and racial and Ethnic Approaches to Community Health (CDC, 2016).

Health professionals’ awareness of, and their ability to recognize and manage SDoH, varies in part to the focus of their training curriculum, the decade in which they were trained, and their own interest in keeping abreast of current practices (National Academies of Sciences, Engineering, and Medicine, 2016). The committee on Educating Health Professionals has partnered with the Board of Global Health, Institute of Medicine, and National Academies of Science, Engineering, and Medicine to create *A Framework for Educating Health Professionals to Address the Social Determinants of Health* (National Academies of Sciences, Engineering, and Medicine, 2016). The book describes several frameworks and conceptual models for addressing SDoH.

The impact of SDoH on health outcomes is significant (Braveman, Egerter, & Williams, 2011; Braveman & Gottlieb, 2014). A meta-analysis of almost 50 studies found that the social factors accounted for over a third of total deaths in the U.S. in a year (Heiman & Artiga, 2018). (McGinnis, Williams-Russo, & Knickman, 2002) demonstrated the following determinants of health that contribute to premature death as follows: genetic predisposition (30%), social circumstances (15%), environmental exposures (5%), behavioral patterns (40%) and healthcare (10%). While access to healthcare is an important factor (10%), ensuring that the healthcare provided is high quality, safe and appropriate is also important (Daniel, Bornstein, & Kane, 2018; Schroeder, 2007). Resources should be allocated for the larger piece of the pie of modifiable factors such as behavioral patterns that contribute to premature death, for example obesity, tobacco and opioid use these can make a large contribution to health outcomes (Schroeder, 2007).

The Executive Director of the American Public Health Association wrote an editorial for the Fall 2016 *Journal of Pharmaceutical Education* titled “Ensuring Population Health: An important Role for Pharmacy” (Benjamin, 2016). The article discussed that public health and population health are not synonymous with each other and include the definitions and comparisons of both (Benjamin, 2016). Population Health is the field of health outcomes, patterns of health determinants and the policies and interventions that link the two, which is different from public health, health promotion, and social epidemiology (Benjamin, 2016). Public health is concerned with threats based on population health analysis; public health utilizes population health methods as a tool (Benjamin, 2016). One of the major take-away points from the article is a call for pharmacy educators to ensure population health skills are included in the training and curricula, preferably through interdisciplinary relationships with schools of public

health so that clinical disciplines and trained together and function as a management team for patients (Benjamin, 2016). Additionally, if pharmacists are to make a greater impact on healthcare, they must function beyond the traditional approaches and address SDoH (Benjamin, 2016).

In response to the need for increased access to healthcare for the nation, the role of pharmacists, as with many healthcare professions, has expanded (Addy, Browne, Blake, & Bailey, 2015; U.S. Department of Veterans Affairs [VA], 2015a). Pharmacy curriculums nationally have evolved to include a more direct patient care model that entail higher clinical concentration compared to the traditional distributive function (Accreditation Council for Pharmacy Education [ACPE], 2015; King & Egras, 2015; Offiong et al., 2011; Patterson, 2008). Curriculums with higher clinical concentration include didactic work with increased pharmacotherapeutic and disease state management modules with expanded number of clinical rotations to strengthen clinical knowledge to help close the gap of access to healthcare.

Policies and continued support from the Veterans Health Administration (VHA), which issues scope of practice (SOP) to clinical pharmacy specialists (CPS) in Department of Veterans Affairs (VA) hospitals, have authorized pharmacists to function with a high level of autonomy and independent clinical decision-making for activities included in the SOP and collaboratively with the health care team for the overall care of veterans (Ourth, Groppi, Morreale, & Quicci-Roberts, 2016; VA, 2015a; VA, 2015b). This document provides that CPS with clinical privileges in a VA setting to initiate, modify, continue, or discontinue medications for veterans (VA, 2015b). Further, CPS have the authority to order labs for patients, and perform physical examinations.



VA pharmacists have gained more independence and can not only participate in inter-professional rounds, but also manage chronic illnesses (e.g., diabetes, hypertension, heart failure) to help patients meet target goals for their respective disease state. While chronic disease management provides many additional opportunities for pharmacists, it also benefits the veteran population by decreasing the access gap for primary care. When health professionals, including clinical pharmacists, function at the top of their license, to manage chronic disease illnesses, they also help decrease patient appointment wait times for primary care physicians (PCP) so that PCPs can have time to dedicate towards their high complexity patients.

### **Statement of Purpose**

The purpose of this project was to evaluate VA post-graduate pharmacy residency program directors' and residents' knowledge about SDoH. A brief assessment tool was administered to provide some insight into the current clinical practices about education in SDoH, and their use of SDoH in clinical practice settings.

### **Literature Review**

The U.S. spends a higher proportion of its gross domestic product (17.1% in 2014) on healthcare than any other country, but is ranked 37 out of 191 countries on the WHO's listing in overall health of a nation's population (WHO, 2000). The other top three expenditures in the U.S. Gross Domestic Product (GDP) include approximately 15% on defense, 24% on social security and 13% on Medicare. As a comparison, Canada, a developed country with universal healthcare, spends 10.4% of its GDP and is ranked 30/191. The GDP of the U.S. is 18.5 trillion dollars, whereas Canada's GDP is 1.5 trillion U.S. dollars (The World Bank, n.d.). In the U.S. the overall expenditure cost on social services and health care is similar to other western

countries, although the US spends more on health care and less on social services (Heiman & Artiga, 2018).

### **The Role of Pharmacists in Improving Population Health**

The Accreditation Council for Pharmacy Education (ACPE) updated their standards in 2016 to include public health in the didactic education for pharmacy students (ACPE, 2015). ACPE standard two refers to the graduate being able to describe how population based care influences patient care. ACPE standard three refers to integration of cultural sensitivity and that the graduate being able to recognize SDoH to diminish disparities and inequalities to provide quality care for patients.

Research indicates that the increased role of pharmacists has resulted in beneficial effects for patients (Ashjian, Kurtz, Renner, Yeshe, & Barnes, 2017; Cohen et al., 2011; Taveira, Dooley, Cohen, Wu, & Khatana, 2011; You, Kawamoto, & Smith, 2014). One study looked at the impact of a postgraduate year two (PGY-2) pharmacy resident managed clinic on veterans' glycosylated hemoglobin (A1c), low density lipoprotein (LDL), and systolic and diastolic blood pressures (SBP and DBP). Study participants were veterans with Type 2 Diabetes Mellitus with A1c > 7%, LDL > 100 mg/dL, SBP > 130 mmHg, and/or DBP > 80 mmHg. Results showed significant improvement in all lab values (A1c, LDL, SBP, DBP) at both three and six months. A significant reduction was not observed, although, a downward trend was noted in the percentage of patients meeting the ADA treatment goals for A1c, LDL, SBP, and DBP individually after six months (Lamb, Baker, & McFarland, 2015).

Another study evaluated the benefit of adding a Veterans Affairs Multi-disciplinary Education and Diabetes Intervention for Cardiac risk reduction (VA-MEDIC) intervention to type 2 diabetic Veterans' usual care (Taveira et al., 2011). In the study, veterans with type 2

diabetes, with an A1C between 7% and 9% within the previous six months, and who were 18 or older, were randomized into either a VA-MEDIC arm or a usual care arm. Those in the VA-MEDIC arm received a VA-MEDIC intervention in addition to their usual care, which consisted of a 40- to 60-minute educational component by a nurse, nutritionist, physical therapist, or pharmacist, followed by pharmacist-led behavioral and pharmacological interventions. Results of the study indicated that a significantly greater proportion of participants in the VA-MEDIC arm than in the usual care arm attained the ADA target goal for A1C (40.4% in the VA-MEDIC arm vs. 21.6% in the usual care arm), systolic blood pressure (65.5% in the VA-MEDIC arm vs. 39.9% in the usual care arm), and diastolic blood pressure (87.9% in the VA-MEDIC arm vs. 68.6% in the usual care arm). Significant differences between the two groups were not seen for attainment of LDL or smoking cessation target goals.

There are various modalities of care by which patient care is provided in clinics: face to face via the traditional 1:1 (provider: patient), face to face group clinics (1 provider: multiple patients) and telehealth (Center for Connected Health Policy, n.d.). Telemedicine has emerged as a modality of care to help narrow the gap in access to healthcare in rural areas. Clinical pharmacists at the VA are involved in chronic disease state management in rural areas. A study by Hatton, Chandra, Lucius, and Ciuchta (2017) compared patient satisfaction between pharmacy managed face to face clinic encounters versus clinical video conferencing (CVT) encounters. The results of the study demonstrated that patients are satisfied with pharmacists' use of patient-centered communication and clinical competence and skills via both CVT and face-to-face consultations. Clinical pharmacists are not only involved in direct patient care helping to manage chronic diseases, but they also contribute to the body of literature in novel healthcare delivery systems.

**Food insecurity.** Food insecurity exists when “the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain” (Andersen, 1990, p. 1560). It is a serious and significant concern that affects many Americans who do not have enough food to eat, either on a daily basis or at the end of the month when resources have been exhausted. In 2016 in the United States, 15.6 million were food insecure, 9.4 million people were in a low food secure household in 2016, and 6.1 million adults lived in very low food secure (United States Department of Agriculture, 2017). Twenty-seven percent of Iraq-Afghanistan war veterans had food insecurity (Widome, Jensen, Bangerter, & Fu, 2015). Households that report being food insecure at some time during the year are typically food insecure for seven months during that year. Food insecurity affects the entire family living in the household. Food insecurity reflects a decreased dietary variety and increased consumption of energy-dense foods such as refined grains, added sugars, higher saturated/trans fats, all of which are of poor nutritional quality. U.S. adults living in food insecure households consume fewer servings of fresh fruits, vegetables and dairy. These diets have lower levels of micronutrients such as B complex vitamins, magnesium, iron, zinc and calcium. These dietary patterns have directly been linked in research to the development of chronic diseases such as hypertension, hyperlipidemia and diabetes (Seligman, Laraia, & Kushel, 2010; Silverman et al., 2015).

The consequences of food insecurity can potentially be life-threatening. There are inherent risks from low blood sugars among elderly people with diabetes who do not have a stable source of food. Certain medications (sulfonylureas, beta blockers, trimethoprim-sulfamethoxazole and haloperidol) are linked to hypoglycemia among the food insecure (O'Toole, Roberts, & Johnson, 2017). The risk for hospital admissions for hypoglycemia

increased 27% during the last week of the month among the low-income populations. Increased missed appointments at doctors' offices are common during the last week of the month (Silverman et al., 2015). This is typically the time when food supplies are low.

In the general population, people living with food insecurity tend to report higher levels of depression, stress, and anxiety (Silverman et al., 2015). Depression is associated with poorer glycemic control, adherence to dietary and medication regimen (Kushel, Gupta, Gee, & Haas, 2006; Silverman et al., 2015). Individuals with food insecurity report taking medication less often, to have money to buy food. Studies support that children with food insecurity have adverse health effects such as increased rates of iron-deficiency anemia, acute infection, chronic illness, and developmental and mental health problems (Seligman et al., 2010; Silverman et al., 2015). A large body of evidence demonstrates associations between food insecurity and overweight/obesity among children and adult women (O'Toole et al., 2017; Seligman et al., 2010; Silverman et al., 2015).

Seligman, Laraia, and Kushel's (2010) examination of the National Health and Nutrition Examination Survey (NHANES) 1999-2004 data sought to explore the association of food insecurity with chronic diseases such as hypertension, hyperlipidemia and diabetes in a sample of 5,094 poor adults (aged 18 to 65 years). Seligman et al. (2010) found a statistically significant relationship between food insecurity and self-reported hypertension, but not diabetes. When a stricter definition of food insecurity was used, and body mass index (BMI) was added as a covariate to diabetes, a statistically significant relationship between food insecurity and diabetes emerged.

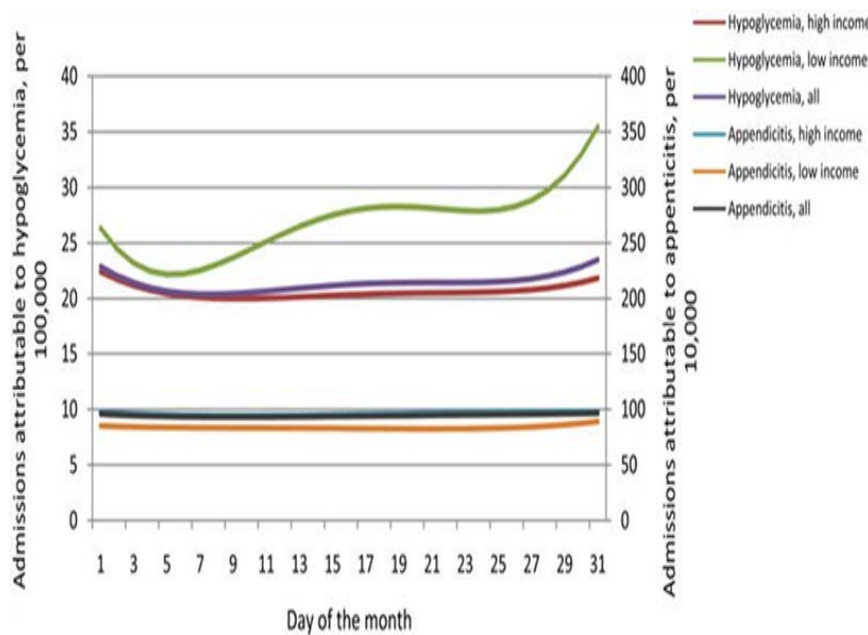
Silverman et al. (2015) explored the relationship between food insecurity and depression, diabetes distress and medication adherence among low-income participants with poorly

controlled diabetes from three healthcare systems (a large public hospital, a VA medical center, and a community hospital). This study used the six-item food security module by the Department of Agriculture, PHQ-8, diabetes distress scale, and Morisky Medication Adherence Scale (Morisky, Green, & Levine, 1986). The prevalence of food insecurity among participants was 47.4%. Chi-square tests demonstrated that participants with food insecurity were more likely to be depressed (40.7% vs 15.4%,  $p < .001$ ), report diabetes distress (55.2% vs 33.8%,  $p < .001$ ), and have low medication adherence (52.9% vs. 37.2%,  $p = .02$ ).

Seligman et al. (2010) assessed findings from a food insecurity screening of a national sample of veterans' administration clinics for homelessness and formerly homeless veterans from six veterans' administration primary care clinics. The average age of the patients was 53 years. A total of 270 patients were screened, 131 screened positive for food insecurity in the previous three months. Of the 48.0% who screened positive for food insecurity, 55.0% reported an average of two meals a day, and 27% averaged one meal a day. Eighty-seven percent prepared their own meals, relying on food they bought (54.2%), help from friends and family (19.1%), as well as soup kitchens and food pantries (22.0%). Forty-seven percent received supplemental nutrition assistance program benefits (food stamps). Of the 48.0% who screened positive for food insecurity, 19.8% had diabetes or prediabetes and 43.5% reported hypoglycemia symptoms when without food. This study demonstrated the high prevalence of food insecurity among the clinics that serve the homeless veterans populations. It is critical to address concerns related to social determinants of health with veterans and this study provide an example how food insecurity assessment can be incorporated into the primary care setting.

Income level and risk of hypoglycemia among people with diabetes are closely related. Food budgets are frequently depleted at the end of the month compared to other times (Seligman,

Bolger, Guzman, Lopez, & Bibbins-Domingo, 2014). Patients change in eating habits at the end of the month because they have less money to purchase food. It is critical for healthcare professionals to know this information so that adjustments to anti-diabetic medications can be modified to lessen risks for hypoglycemia. However, patients' eating patterns will not be known by providers and other healthcare professionals if patients are not asked about food insecurity. Patients may hesitate to share information about lack of money at home due to embarrassment. It is, however, the responsibility of the healthcare system to develop innovative ways to obtain social information about patients that affect their overall health. Admissions for hypoglycemia were more common in the low-income compared to high income population and risk for hypoglycemia increased by 27 percent in the last week compared to the first week in the low-income population (Seligman et al., 2014) (see Figure 1).



*Figure 1.* Emergency room admissions attributable to hypoglycemia and appendicitis among patients aged eighteen and older at accredited California hospitals on each day of the month, by income level, 2000-2008.

**Health Inequality**

Healthy People 2020 defines *health equity* as the

“attainment of the highest level of health for all people. Achieving health equity requires valuing everyone equally with focused and ongoing societal efforts to address avoidable inequalities, historical and contemporary injustices, and the elimination of health and health care disparities” (Healthy People 2020, n.d., fourth paragraph).

Health inequity is different from health inequality in that health inequality or health disparity refers to differences in health of individuals or group (Arcaya, Arcaya, & Subramanian, 2015; Kawachi, Subramanian, & Almeida-Filho, 2002). Any measurable variable of health that is different across individuals/groups that can be socially grouped can be called a health inequality. Health inequity takes into consideration the moral judgment on whether the observed differences are justifiable which is absent in health inequality (Arcaya et al., 2015; Kawachi et al., 2002).

Between 2003 and 2006, the direct cost of health inequalities based on race/ethnicity in the U.S. estimated \$229.4 billion (LaVeist, 2009). Whereas, if health inequalities were eliminated for minorities, we would have reduced indirect costs associated with illness and premature death by more than one trillion dollars (LaVeist, 2009). A meta-analysis of 155 papers that explored income inequality and population health found that overall health tends to be poorer in societies that are less equal (Wilkinson & Pickett, 2006). Policymakers, researchers and public health practitioners are tasked with and explore avenues to reduce and/or eliminate differences in health based on geographic location, cultural background, socioeconomic status, education, income and additional social factors.



A description of health inequality is racial/ethnic disparities with U.S. infant mortality rates. In 2015, infant mortality rates are almost two times as high for non-Hispanics Blacks at 11.3% versus non-Hispanic Whites at 4.9% (Rice, Goldfarb, Brisendine, Burrows, & Wingate, 2017). The differences in infant mortality rates among racial/ethnic groups in the U.S. are mostly attributed to differences in education and access to prenatal care, both of which are preventable (Rice et al., 2017). This is an example where infant mortality can be reduced if policies and programs are in place to improve access to healthcare and prenatal care for the underserved racial/ethnic groups.

Strong disparities in health equity exist across countries. In 2010, for example, a healthy life expectancy differed in Haiti and Japan by almost two times, 27.8 years and 70.6 years respectively (Salomon et al., 2012). In India, people from the poorest quintile of families are 86% more likely to die than families from the wealthiest fifth of families (Subramanian, Ackerson, Subramanyam, & Sivaramakrishnan, 2008; Salomon et al., 2012).

### **Population Health**

In “*Why Are Some People Healthy and Others Not? The Determinants of Health of Populations*”, Evans, Barer, and Marmor (1994) describe concepts related to determinants of the health of populations, though a concise definition of population health was not proposed. Population health was defined by Kindig and Stoddart (2003) as “the health outcomes of a group of individuals, including the distribution of such outcomes within the group” (p. 1). They proposed that the field of population health includes policies and interventions that link health outcomes and patterns of health determinants.

Populations are usually referred to as a community within a geographic region. Populations can be further be classified as smaller groups such as employees, ethnic groups,

prisoners, veterans, children, students, disabled persons, or prisoners. These sub-groups are important because policy makers generally target healthcare policies for a single sector or advocacy group; although there is an argument that the population health perspective encompasses the overall health of a nation. While exploring and researching one single health determinant, outcome measurement or policy intervention is important, but it must also be recognized that this is only part and not a whole picture of the system. Population health researchers often use methodologies that examine systematic differences in outcomes across populations that involve interactions among health determinants. They attempt to create the bridge that's needed to link determinants of population health outcomes and determinants throughout the life cycle.

### **Healthy People**

Over the past three decades, Healthy People (HP) initiatives were designed to educate the nation that health is created through the conditions in which we live our daily lives, and less about the absence of diseases. Congress created the Office of Disease Prevention and Health Promotion (ODPHP, n.d.a) in 1976 to lead disease prevention and health promotion efforts in the U.S. ODPHP is part of the U.S. Department of Health and Human Services (DHHS) under the Office of the Assistant Secretary for Health. ODPHP plays a vital role in keeping the nation healthy. The organization accomplishes this by setting national health goals and objectives and supporting programs, services, and education activities that improve the health of all Americans.

ODPHP (n.d.a) manages group sites: *health.gov*, *HealthyPeople.gov*, and *healthfinder.gov*. Each website adds a unique set of valuable information to the nation, public health officials and the public at large. For example, *health.gov* is the home of ODPHP and an essential resource for health information. *Healthypeople.gov* provides tools and resources for

professionals about HP health objectives. *Healthfinder.gov* provides evidence-based, actionable health guidance for consumers.

HP initiatives were originally launched in 1990 by the U.S. Department of Health, Education, and Welfare (now DHHS) with the purpose of creating a set of measurable, objective and informational objectives every decade that would help monitor progress, motivate people and public health officials into action and guide their efforts as everyone works toward an improvement in the nation's health. Many of the interventions were linked to behavioral and social interventions (McGinnis, 1991). HP 1990 (1989) encompassed 15 public health initiatives with 226 objectives. The overarching goals were to decrease mortality from infants to adults and to increase independence among older adults. In 1990, one target was to reduce infant mortality by 35 percent, and infant mortality declined just under 35 percent by the end of that HP decade. After the positive impact on health after the first HP initiative, the next set of HP initiatives were subsequently expanded to reduce disparities among groups through functional status and quality of life. HP 2000 (2009) included 22 public health initiatives with 312 objectives. The overarching goals were to increase span of healthy life, reduce health disparities, and achieve access to preventive services for all.

The HP 2010 (2011) overarching goals were to increase quality and years of life and eliminate disparities. Some of the leading health indicators (LHIs) that were used to develop the objectives were physical activity, obesity, substance abuse, immunization, and access to healthcare. HP 2010 included 28 public health initiatives and encompassed 969 objectives. HP 2010 also included initiatives to promote healthier behavior, foster safer and healthier communities, improve systems in place for personal and public health initiatives, expand preventive care, and to reduce the burden of disease and disorder. These initiatives encompassed

a broader range of social and behavioral initiatives that included physical activity, food security, family planning, chronic disease management, and public health infrastructure. Many policy changes included health promotion and disease prevention strategies such as increase in sidewalks, walking trails and bike paths, tobacco prevention interventions, decrease in nonfatal firearms deaths, increase in immunizations in children, decrease in suicide rates, and increase in the number of adults with mental illnesses to obtain treatment.

HP 2020 (2010) leading health indicators were developed using the health determinants and health outcomes framework which draws together both the individual and societal determinants that affect the public's health and contribute to health disparities from birth through all stages of aging. In doing so, opportunities to promote health and improve quality of life are highlighted (Hesse et al., 2014). HP 2020 has four overarching goals to help promote overall health of both the individual and society, and to address the determinants that contribute to health disparities from infancy through old age. The overarching goals for HP 2020 are: “to attain high quality, longer lives free of preventable disease, disability, injury, and premature death; achieve health equity, eliminate disparities, and improve the health of all groups; create social and physical environment that promote good health for all; promote quality of life, healthy development, and healthy behaviors across all life stages” (Healthy People 2020, 2010, page 3).

HP 2020 (2010) expanded significantly from HP 2010 to include 42 public health initiatives and about 1,200 objectives. LHIs new to HP 2020 (2010) developed 26 objectives in 12 areas to improve the nation's health and target the determinants of health and health disparities. LHIs use health determinants and health outcomes across life stages framework. Individuals are at different risks throughout their life stages; LHIs recognize an individual's risk

for different health conditions across their lifespan. Interventions are therefore specified at specific points in life to reduce risk factor and promote health.

The Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2030 (Committee) is currently in the early development stages for HP 2030. This is a federal advisory committee composed of non-federal, subject matter experts who provide recommendations to the Secretary of Health and Human Services on HP 2030's framework, vision, mission, overarching goals and new objectives (ODPHP, n.d.b).

### **Pharmacy Residency Training Programs**

Pharmacy residency programs create a rich clinical environment for training future clinical pharmacists. The VA organization has the largest number of pharmacy residency programs nationally. VA residency programs have trainees in areas such as infectious diseases, oncology, medication safety, psychiatry, administration, ambulatory care, nephrology, and pharmacoeconomics, to name a few. Clinical pharmacy specialists (CPS) undergo a credentialing process to obtain a SOP for clinical privileges. A SOP allows CPS to function in the capacity of independent practitioners within the VA setting and as a result, residents are trained in their respective areas to function as independent practitioners. Many VA-trained residents are subsequently hired as VA pharmacists who go on to work as CPS.

**How pharmacists can address SDoH.** Many CPS work as independent practitioners in primary care to manage chronic disease states such diabetes, hypertension, heart failure, and hyperlipidemia. The management of chronic diseases by CPS involves the development of an assessment and plan that involves both pharmacologic and non-pharmacologic treatments. Non-pharmacologic treatment measures involve many avenues, and assessing SDoH factors such as

food insecurity is an integral element in positive healthcare outcomes. This provides the rationale why VA residents should have training in assessing SDoH.

### **Methods**

This study used a brief questionnaire to examine VA post-graduate pharmacy residency program directors' and residents' knowledge about SDoH, as well as their education in SDoH, and their use of SDoH in practice. An online 10-question survey was developed using Survey Monkey<sup>(TM)</sup>. The study is considered IRB-exempt according to the VHA Handbook Research Handbook (VA, 2017).

### **Instrument Development**

The survey assessed knowledge of the following: HP 2020; understanding of population health; training of HP 2020 in residency programs; applicability of population health and pharmacy practice. The survey assessed whether clinical pharmacists/residency program directors and residents ask patients about food insecurity and utilize behavioral change strategies in their clinical practice. The brief questionnaire was developed regarding the specific items on SDoH to obtain preliminary data from the practitioners and trainees postgraduate pharmacy residency programs. Based on an article written by the executive director of the American Public Health Association (Benjamin, 2016), the researchers felt a professional obligation to explore the pharmacy field and assess disparities in practices with population health principles in VA residency training programs. The survey questionnaire was developed by the researcher and research mentors. The VHA residency advisory board and the researcher's mentors at Boonshoft School of Medicine, Department of Population and Public Health Sciences to provide feedback on the questionnaire.

## Data Collection

Survey results were collected over a two-week period (March 14 to 28, 2017). The links to access the survey were emailed to two nationwide VA email groups: VHA Pharmacy Residents 2016-2017 ( $N = 618$ ) and VHA Pharmacy Residency Directors ( $N = 235$ ) by the researcher. Two emails were sent to the email groups one week apart.

## Data Analysis

Data was tabulated according to percentage of responses for each question. Percentages for each question are reflected in Figures 2 through 10 in the descriptive analysis section.

## Results

Sixteen percent ( $n = 100$ ) of pharmacy residents and 24% ( $n = 58$ ) of RPDs completed the survey. Seventy-one percent of residents were in a Post-Graduate Year-1 (PGY1) program, 7% were in a PGY-2 residency in Ambulatory Care, and 22% were in PGY-2 other category in a VA facility (see Table 1).

Table 1

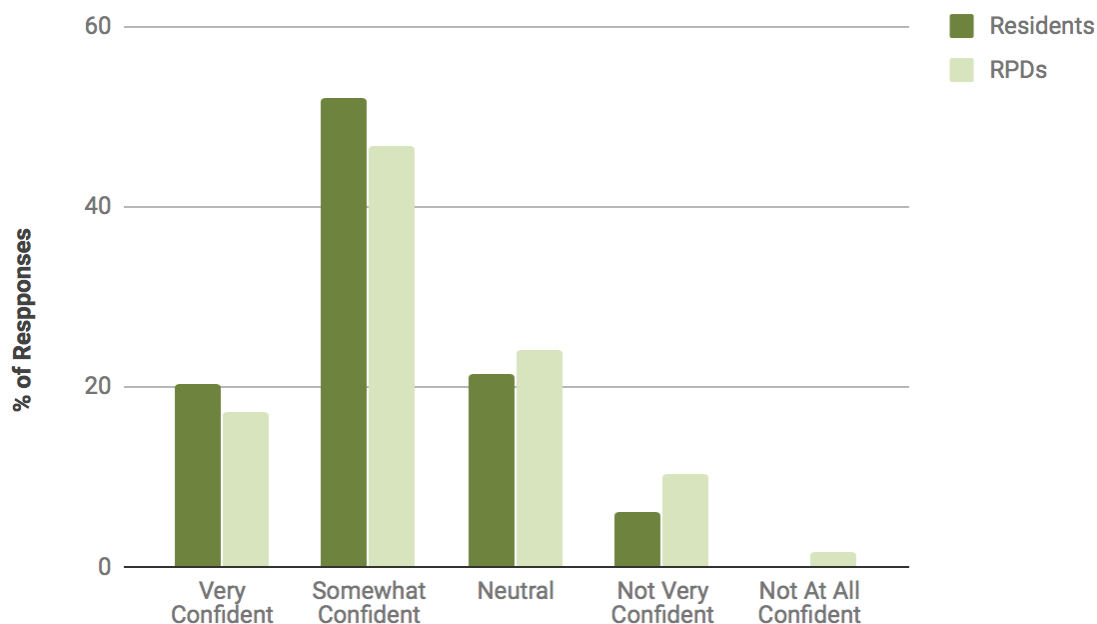
### *Characteristics of Survey Participants*

	Residents (%)	RPDs (%)
Completed Survey	16	24
PGY-1	71	-
PGY-2 (Ambulatory Care)	7	-
PGY-2 (Other)	22	-

## Descriptive Analysis

When asked to describe their level of confidence in understanding how pharmacy practice relates to public health (Figure 2), 20% of residents and 17% RPDs felt very confident

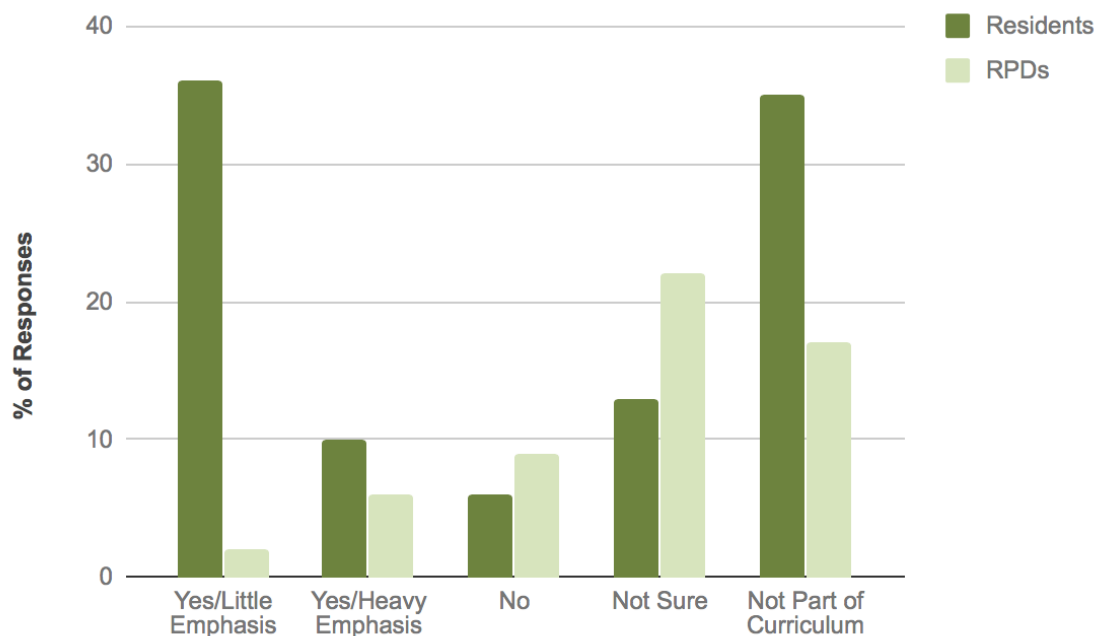
in their understanding of how pharmacy practice applies to population health. Fifty-two percent of residents and 47% RPDs felt somewhat confident, though 6% residents and 10% RPDs were not very confident in their understanding of how pharmacy practice applies to population health.



*Figure 2.* Percentage of responses to “How would you describe your level of confidence in understanding how pharmacy practice applies to population health?”

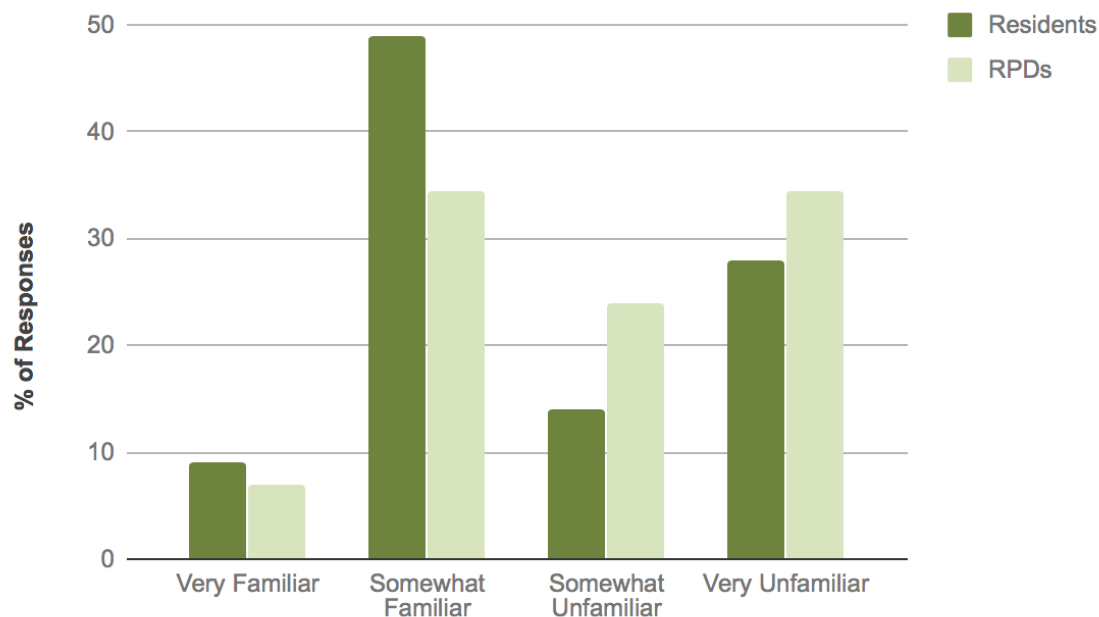
When asked if population health was part of didactic work in pharmacy school (Figure 3), 36% of residents and 2% of RPDs with little emphasis while 10% residents and 6% RPDs had heavy emphasis. Population health was not part of the curriculum for 35% residents and 17% RPDs.





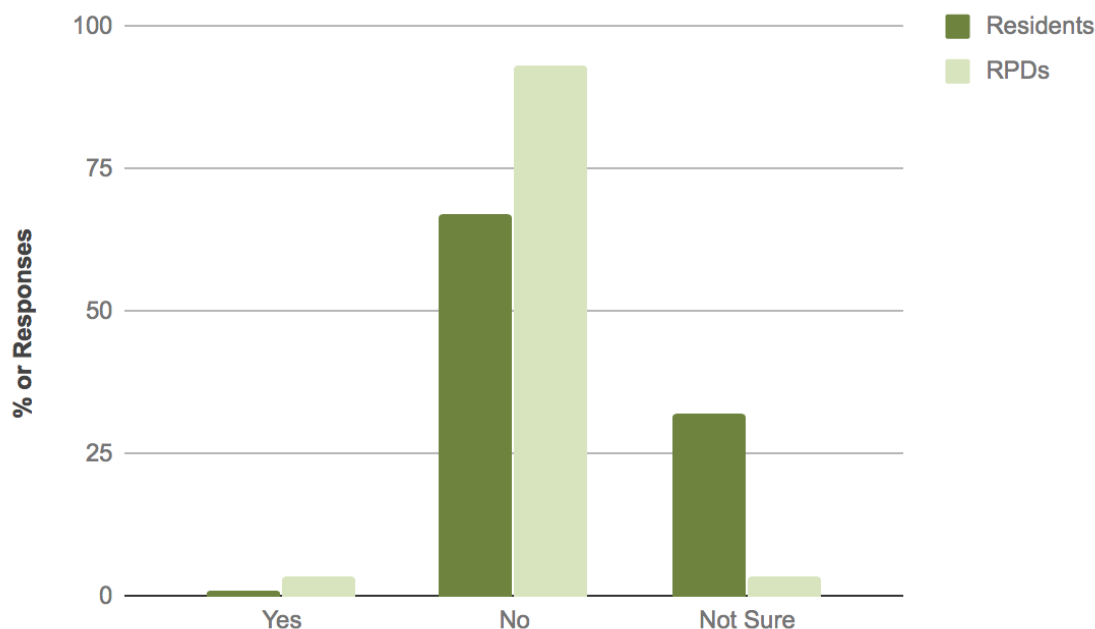
*Figure 3.* Percentage of responses to “If a public health class was part of your didactic work in pharmacy school, was population health discussed?”

When asked how familiar individuals were with HP 2020 (Figure 4), nine percent (9%) of residents and 7% of RPDs were very familiar with HP 2020, while 49% of residents and 35% of RPDs were somewhat familiar. Fourteen percent of residents and 24% of RPDs were somewhat unfamiliar, while 28% and 35% were very unfamiliar with HP 2020.



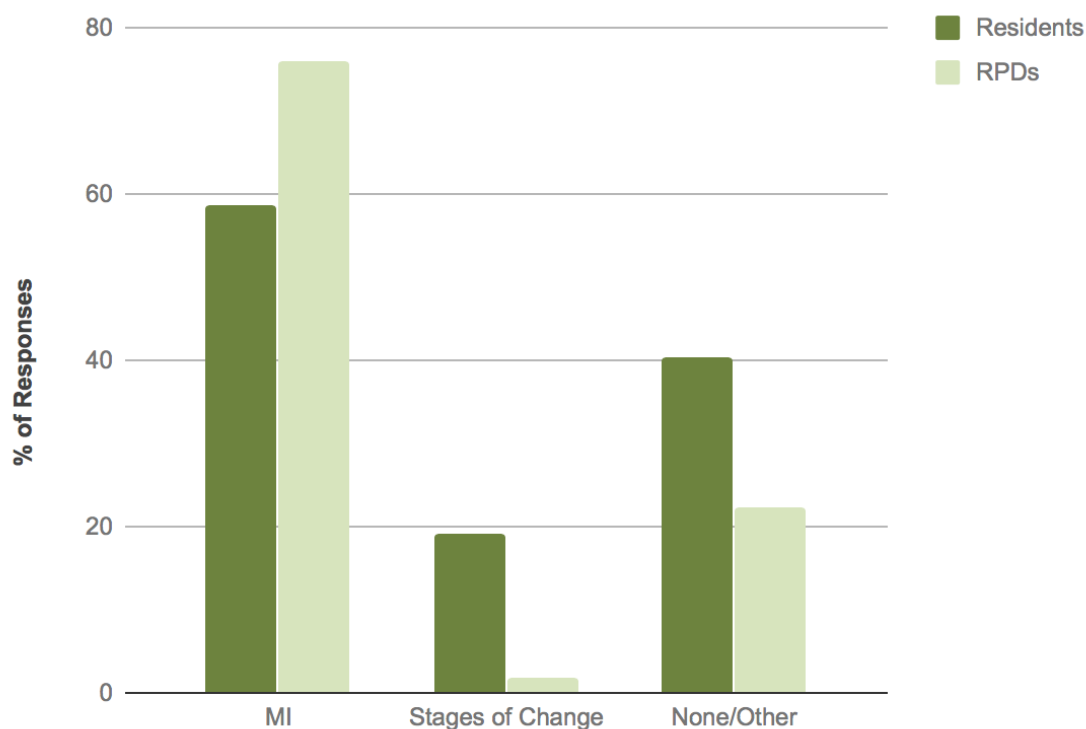
*Figure 4.* Percentage of responses to “How familiar are you with Healthy People 2020?”

When asked what percentage of programs offered training for HP 2020 (Figure 5), only one percent (1%) of residents and 3% of RPDs have training for HP 2020 in their residency program, while 67% residents and 93% RPDs do not have training for HP 2020 in their residency program. Thirty-two percent residents and 4% RPDs were not sure if training for HP 2020 is offered in their residency program.



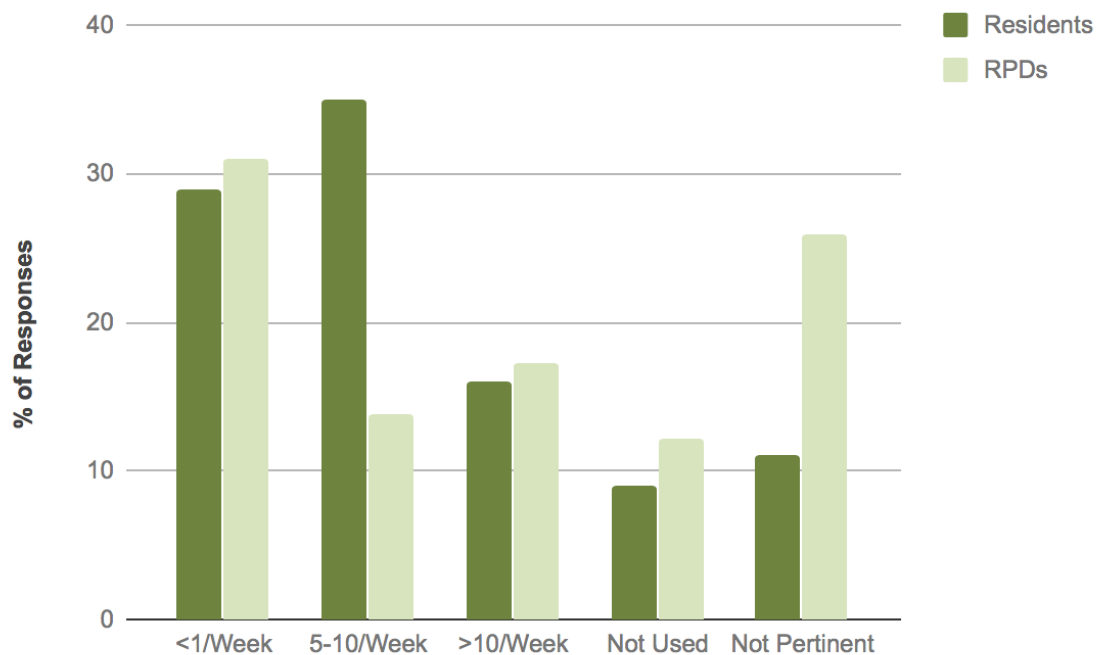
*Figure 5.* Percentage of responses to “Is training/education for Healthy People 2020 offered in your residency program?”

When asked what behavioral change training are offered in programs (Figure 6), motivational interviewing (MI) training is offered for 58% of residents and 76% of RPDs, while ‘stages of change’ behavioral change is offered for 19% residents and 2% RPD. Stages of change is a linear model with a designated start and end point with behavior. This model assumes that each person starts at a different stage. MI is a process initially designed in the substance use disorder field and is now widely used in the chronic disease state management field.



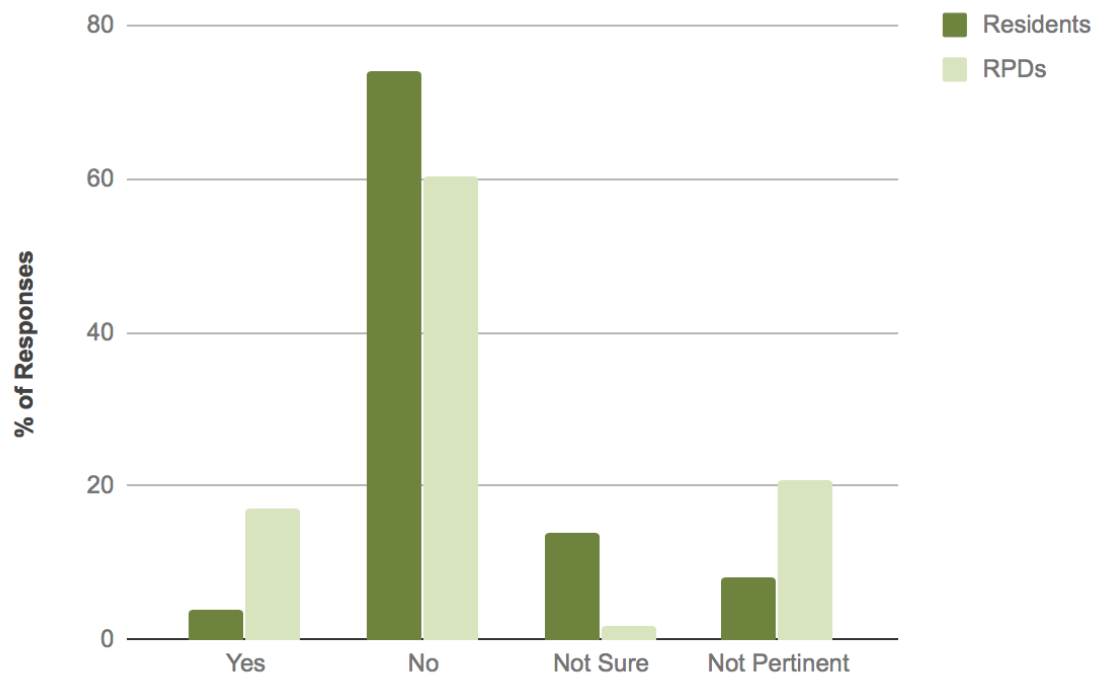
*Figure 6.* Percentage of responses to “What behavioral change training does your residency offer?”

When asked how often are behavioral change skills practiced (Figure 7), 29% of residents and 31% of RPDs practice behavioral change skills less than once weekly, while 35% residents and 14% RPDs practice these skills 5 to 10 times weekly. Eleven percent (11%) of residents and 26% of RPDs feel that these skills are not pertinent.



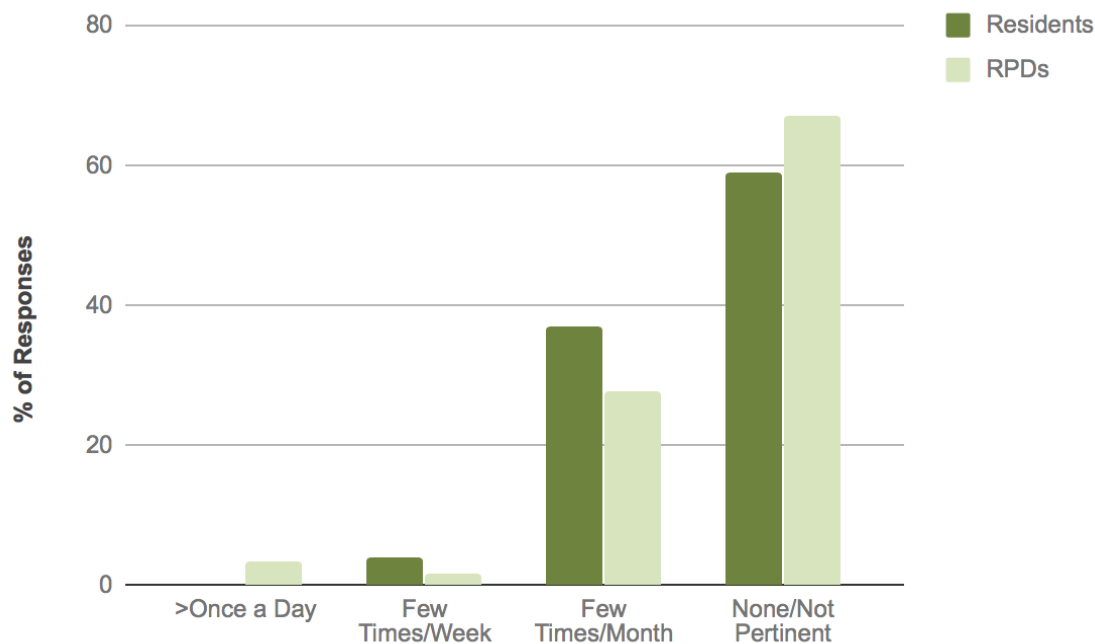
*Figure 7.* Percentage of responses to “How often do you practice these skills with your patients?”

When asked if individuals ask their patients about food insecurity (Figure 8), 4% of residents and 17% of RPDs ask their patients about food insecurity; while 74% residents and 60% RPDs do not ask their patients about food insecurity. Eight percent (8%) of residents and 21% of RPDs thought that asking about food insecurity was not pertinent.



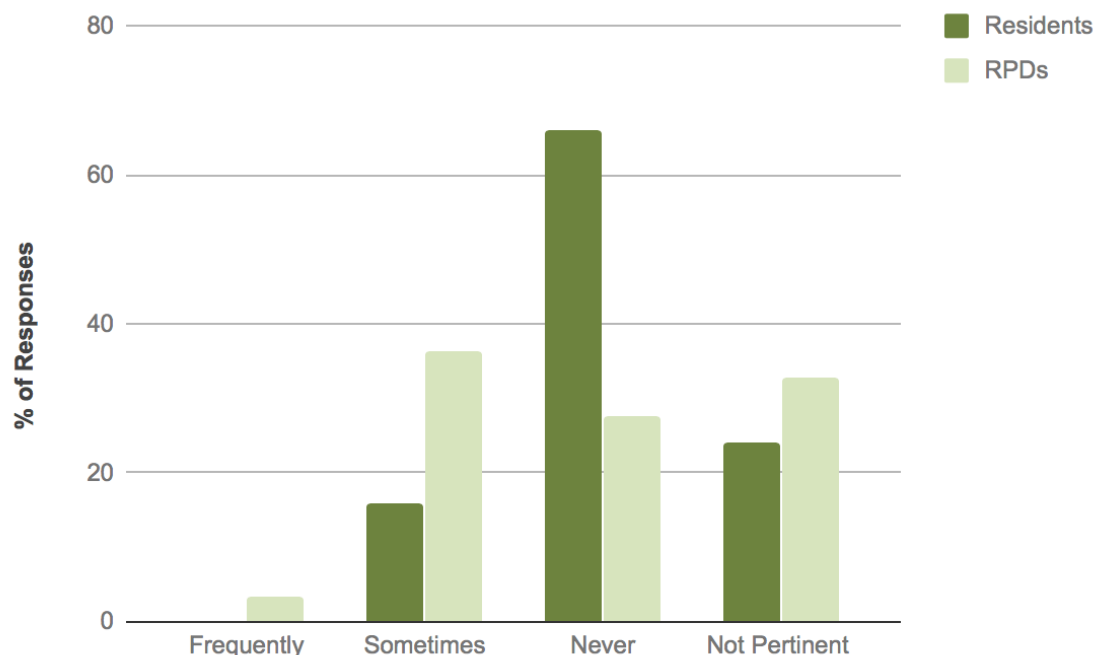
*Figure 8.* Percentage of responses to “Do you ask patients about food insecurity?”

When asked how often do patients in their practice have to choose between buying food vs. medications (Figure 9), 4% of residents and 2% of RPDs ask their patients about food insecurity a few times a week; while 37% of residents and 28% of RPDs ask their patients about food insecurity a few times per month. Fifty-nine percent (59%) of residents and 67% RPDs feel that asking about food insecurity is not pertinent.



*Figure 9.* Percentage of responses to “How often do you ask patients if they have to choose between buying food versus their medications?”

When asked how many individuals enter social worker/nutrition consult (Figure 10), no residents and 4% of RPDs frequently entered a social worker/ nutrition consult for patients with food insecurity. Sixty-six percent (66%) of residents and 28% of RPDs never enter a social worker/nutrition consult for patients with food insecurity while 24% of residents and 33% of RPDs felt that social worker/nutrition consults for patients with food insecurity was not pertinent.



*Figure 10.* Percentage of responses to “How often do you enter a social worker/nutrition consult for patients with food insecurity?”

### Discussion

This study assessed the current curriculum as it pertains to SDoH in VA pharmacy residency programs. The questionnaire specifically addressed knowledge of population health, HP 2020, training of HP 2020 in residency programs and applicability of population health in pharmacy practice. VA pharmacists were also asked if they assess food insecurity and whether they utilized behavior change strategies in their practice. These questions provided a foundation for the profession to explore if SDoH principles are used in pharmacy residency programs.

The results of this study demonstrate that pharmacy residency trainees and program directors experience with SDoH is limited. Residents scored better than program directors in having an expanded knowledge of population health such as HP 2020 initiatives. It is likely that program directors who obtained their pharmacy degree and residency training prior the inclusion



of public health education, such as the HP 2020 initiative, into pharmacy schools' curriculum have less knowledge with regards to SDoH.

Many CPS in the VA have a SOP that allows them to function as practitioners on multidisciplinary teams managing chronic disease states; therefore, the clinical settings provide a rich environment for postgraduate residency training. The VA healthcare system is the largest organization nationally for the training of pharmacy residents. Residency programs and their faculty are key to the advancement of the pharmacy profession's integration of population health principles to address SDoH such as food insecurity. Food insecurity has been identified as a significant factor in the veteran population and the private sector.

As a start, steps to increase awareness of SDoH and population health in curriculum of pharmacists' education were included in the ACPE 2016 standards. Pharmacy accrediting boards must incorporate the education of SDoH and population health principles as part of their faculty's continuing education. Without continuing faculty education, it is unlikely that the full width and breath of the SDoH impact on health outcomes will be appreciated by trainees. If pharmacists are to follow the patient-centric model of care, they must begin by adopting methods of healthcare that is delivered in the context in which patients live their lives. Pharmacy professionals must expand beyond their traditional roles of disease management and pharmacotherapy in an effort to meet the specific needs of those individuals they serve. While knowledge of these determinants is critical, the skills to identify and address them can have a greater impact on the delivery of healthcare.

### **Limitations**

One major limitation of the survey was the response rate for residents and RPDs was 16% and 24%, respectively. A study explored physician response rates to web-based surveys,

suggests healthcare professionals tend to have higher response rates when there's a monetary value attached to the response (Cunningham et al., 2015). Of the residents who responded to the survey, 70% were PGY-1 residents. This was a strength since the survey results is a true reflection of residents in direct patient care clinical setting. The survey was open for two weeks for residency program directors; it is possible if the survey was administered for a longer duration, survey response may have been higher.

VHA prohibits surveys via Qualtrics (<https://www.qualtrics.com/>). In efforts to explore the field of pharmacy residency training programs in VA, the survey must be administered via Survey Monkey (™). Questionnaires via Survey Monkey (™) is free for up to ten questions, for this reason the researchers administered the questionnaire with brevity. Furthermore, a questionnaire was kept brief to minimize time from RPDs and residents' busy schedules.

### **Conclusion**

The adoption of methods that identify and address the SDoH impact on patient health outcomes is a critical step in the transformation of healthcare delivery from its traditional approach. Clinical pharmacy is increasingly expanding the width and breadth of its role in healthcare systems and as a result, its postgraduate residency training programs have been adapting. The future of pharmacy residency training curriculums must incorporate SDoH principles if the profession is to meet the needs of an integrated, multi-professional healthcare system.

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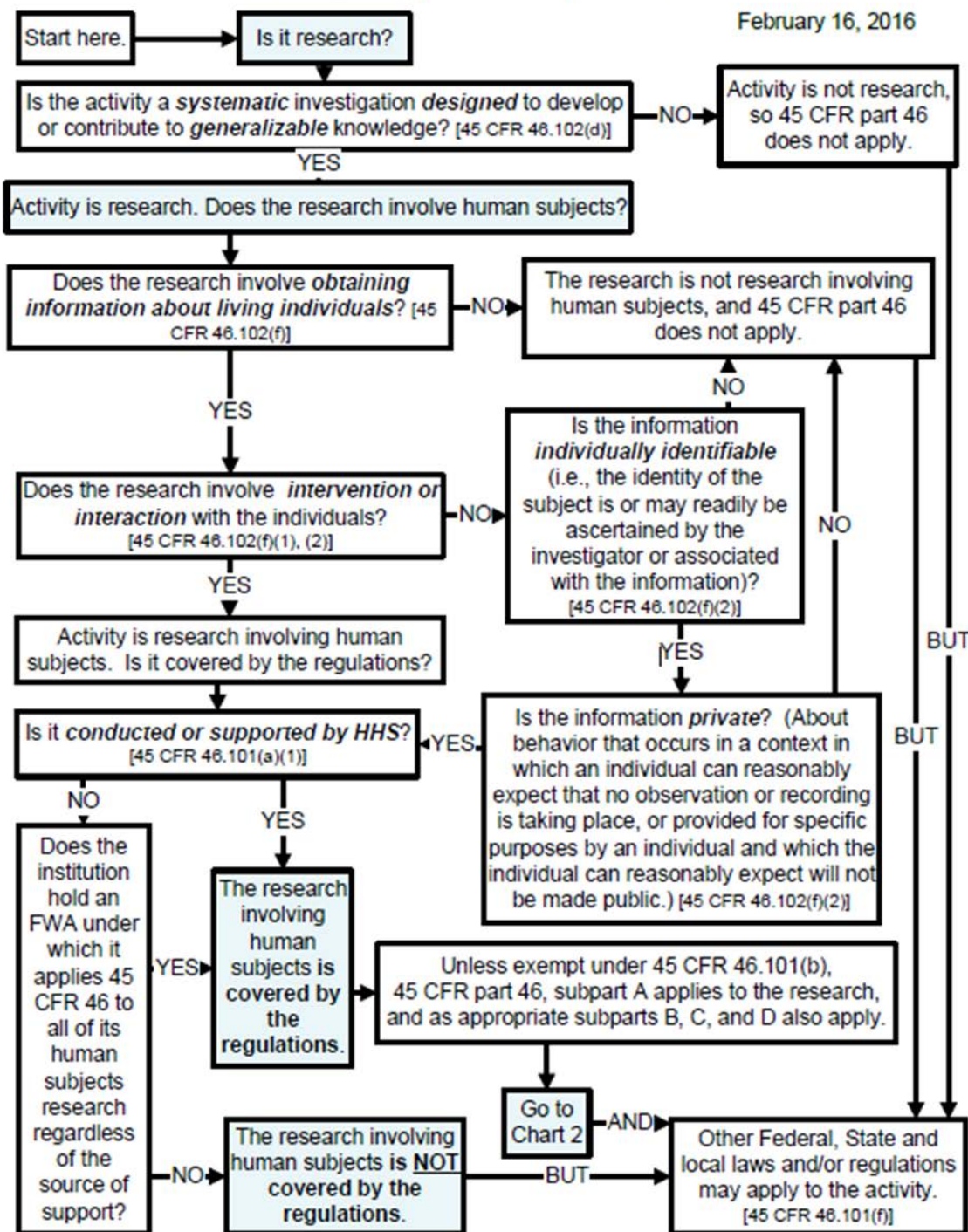
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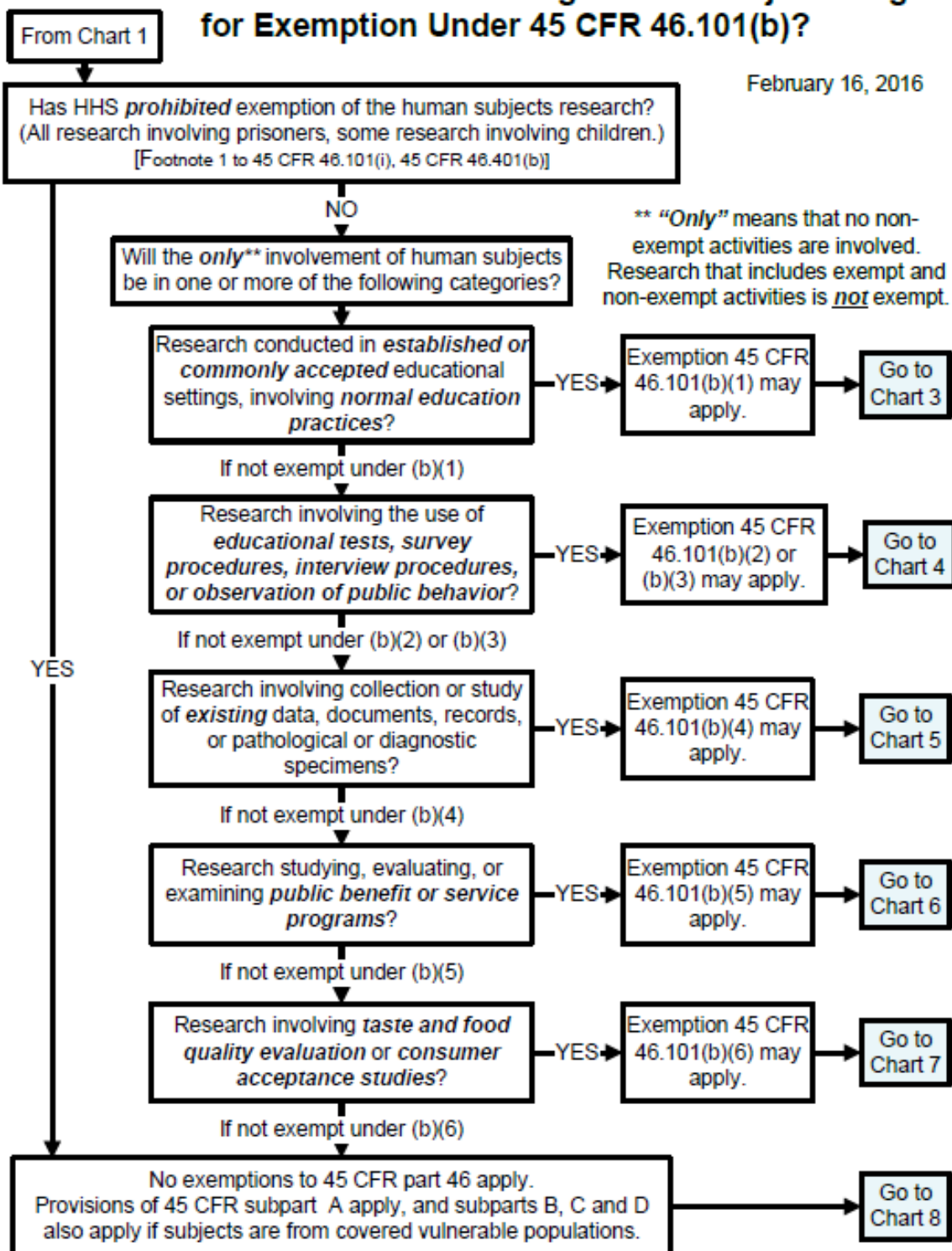
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## Appendix A – Human Subjects Regulations Decision Charts

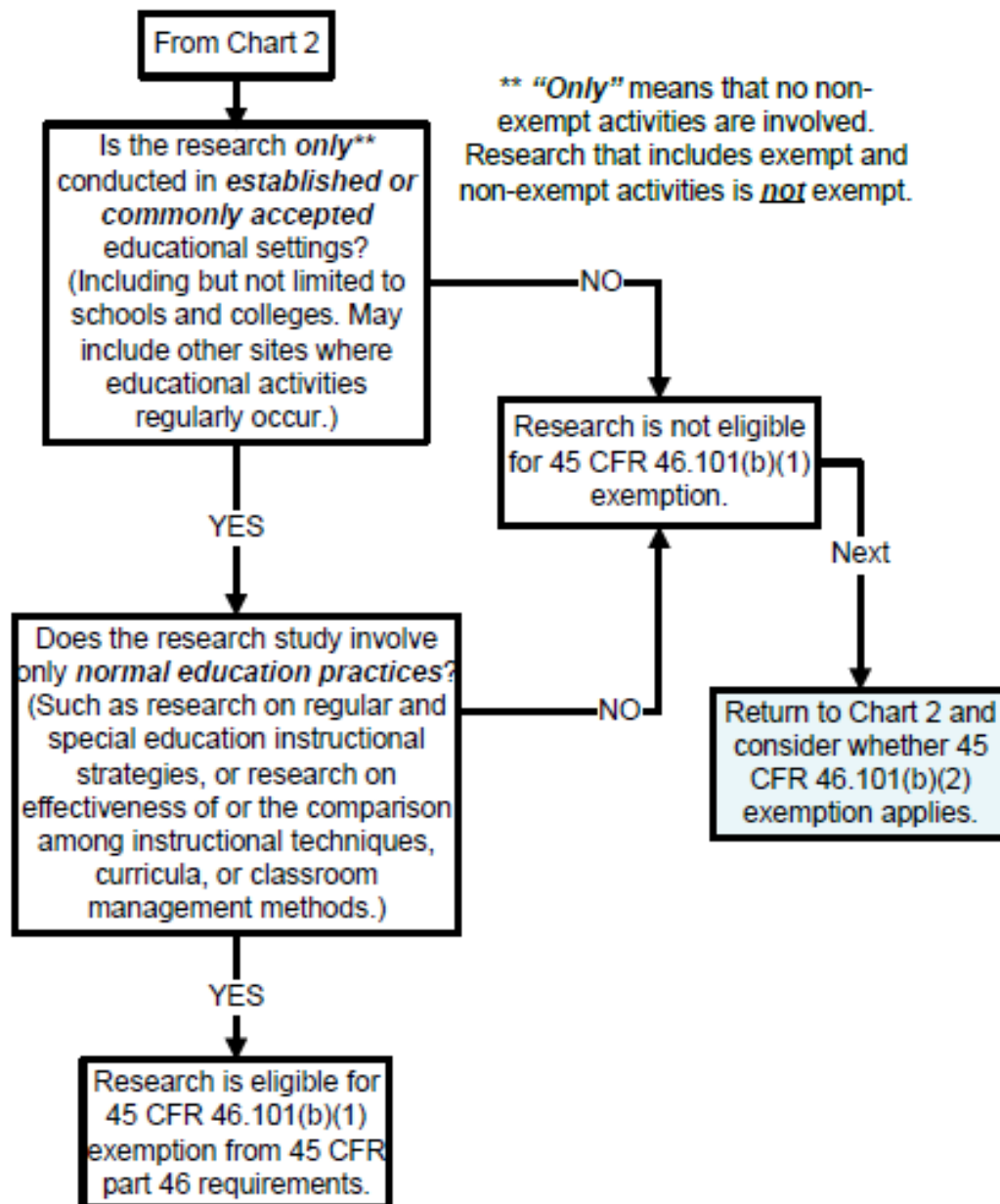
**Chart 1: Is an Activity Research Involving Human Subjects Covered by 45 CFR part 46?**



**Chart 2: Is the Research Involving Human Subjects Eligible for Exemption Under 45 CFR 46.101(b)?**



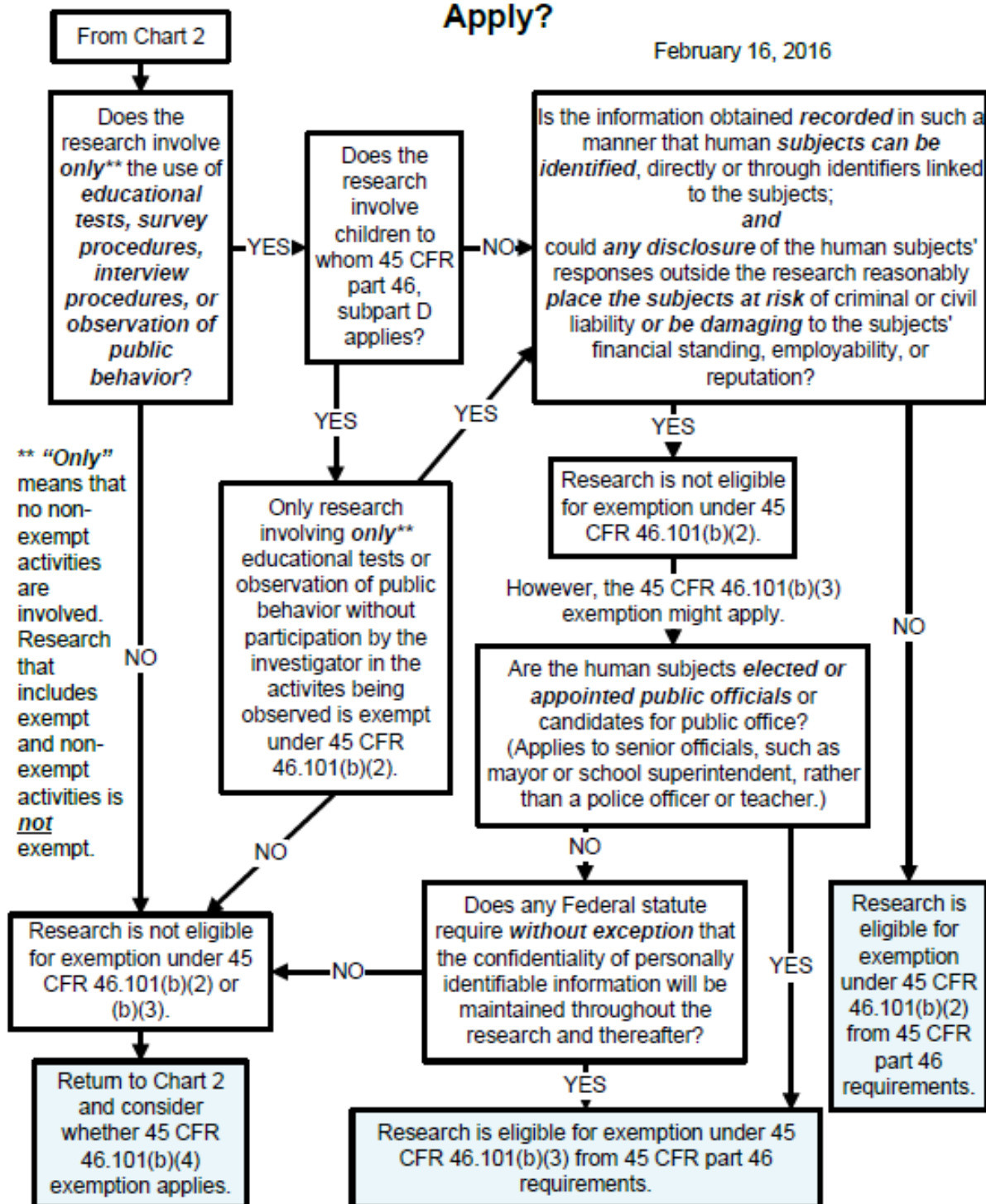
**Chart 3: Does Exemption 45 CFR 46.101(b)(1)  
(for Educational Settings) Apply?**



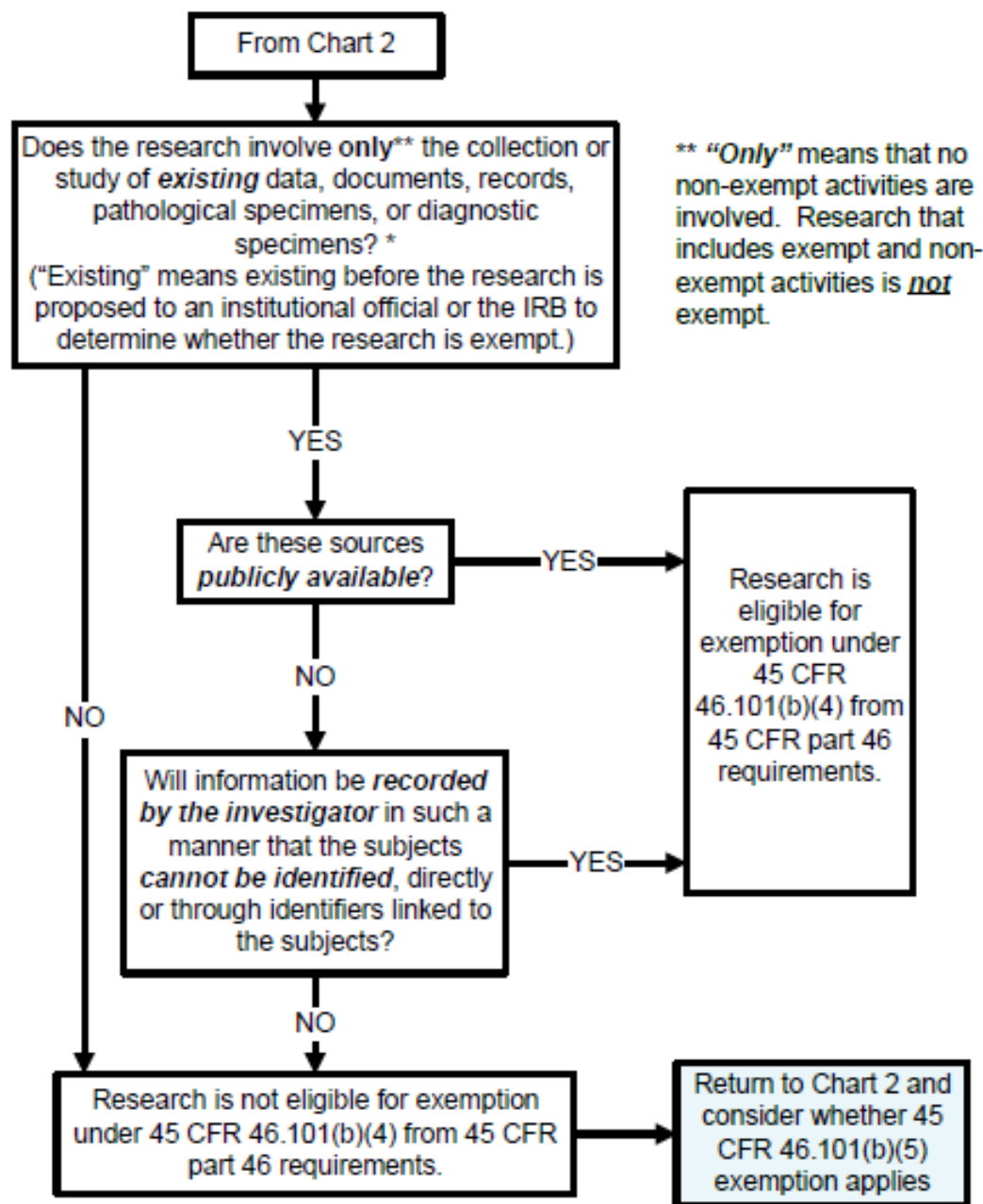
February 16, 20126



**Chart 4: Does Exemption 45 CFR 46.101(b)(2) or (b)(3)  
(for Tests, Surveys, Interviews, Public Behavior Observation)  
Apply?**



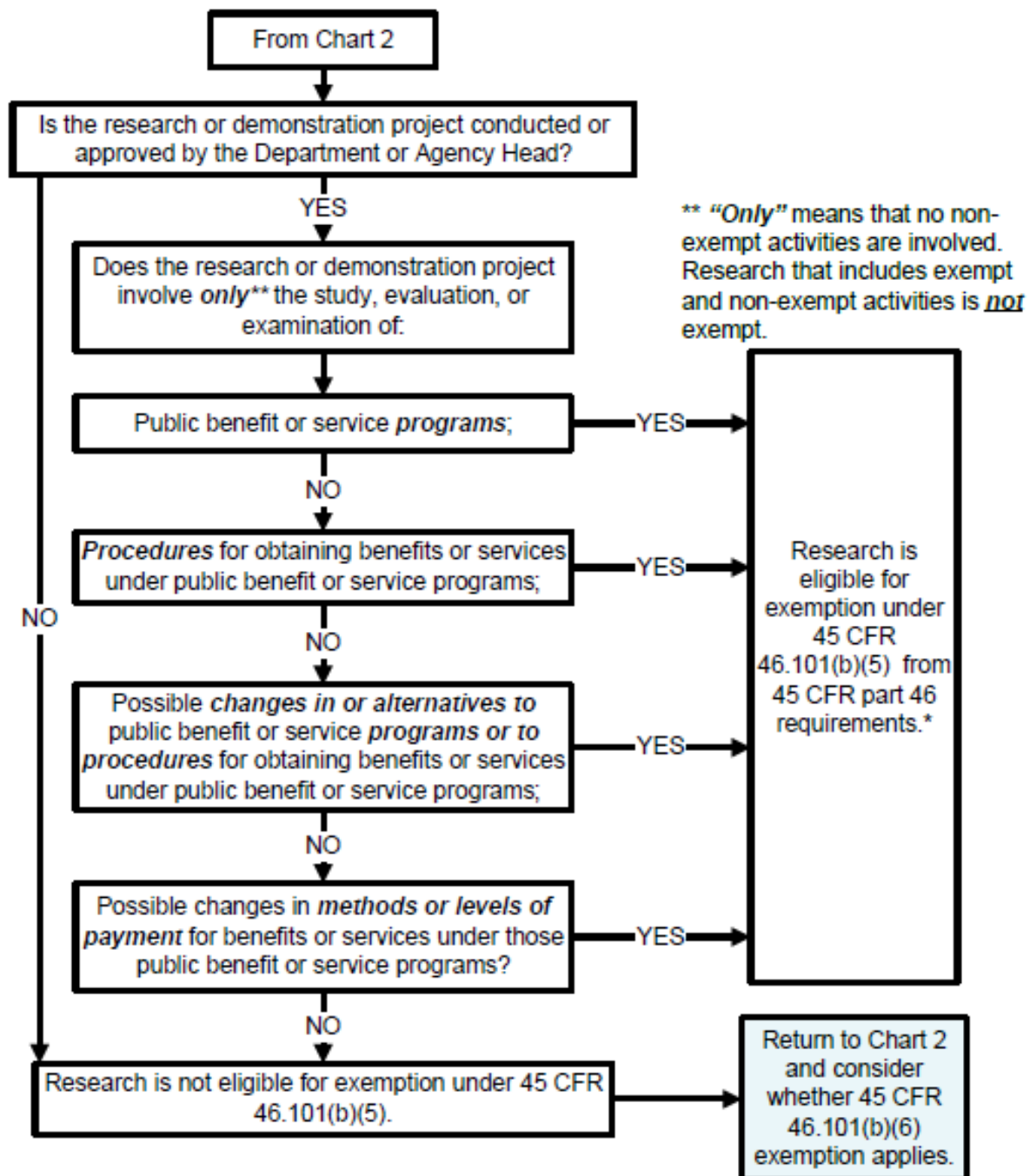
### Chart 5: Does Exemption 45 CFR 46.101(b)(4) (for Existing Data Documents and Specimens) Apply?



\* Note: See OHRP guidance on research use of stored data or tissues and on stem cells at <http://www.hhs.gov/ohrp/regulations-and-policy/guidance/guidance-on-research-involving-stem-cells/index.html>, and on coded data or specimens at <http://www.hhs.gov/ohrp/regulations-and-policy/guidance/research-involving-coded-private-information/index.html> for further information on those topics.

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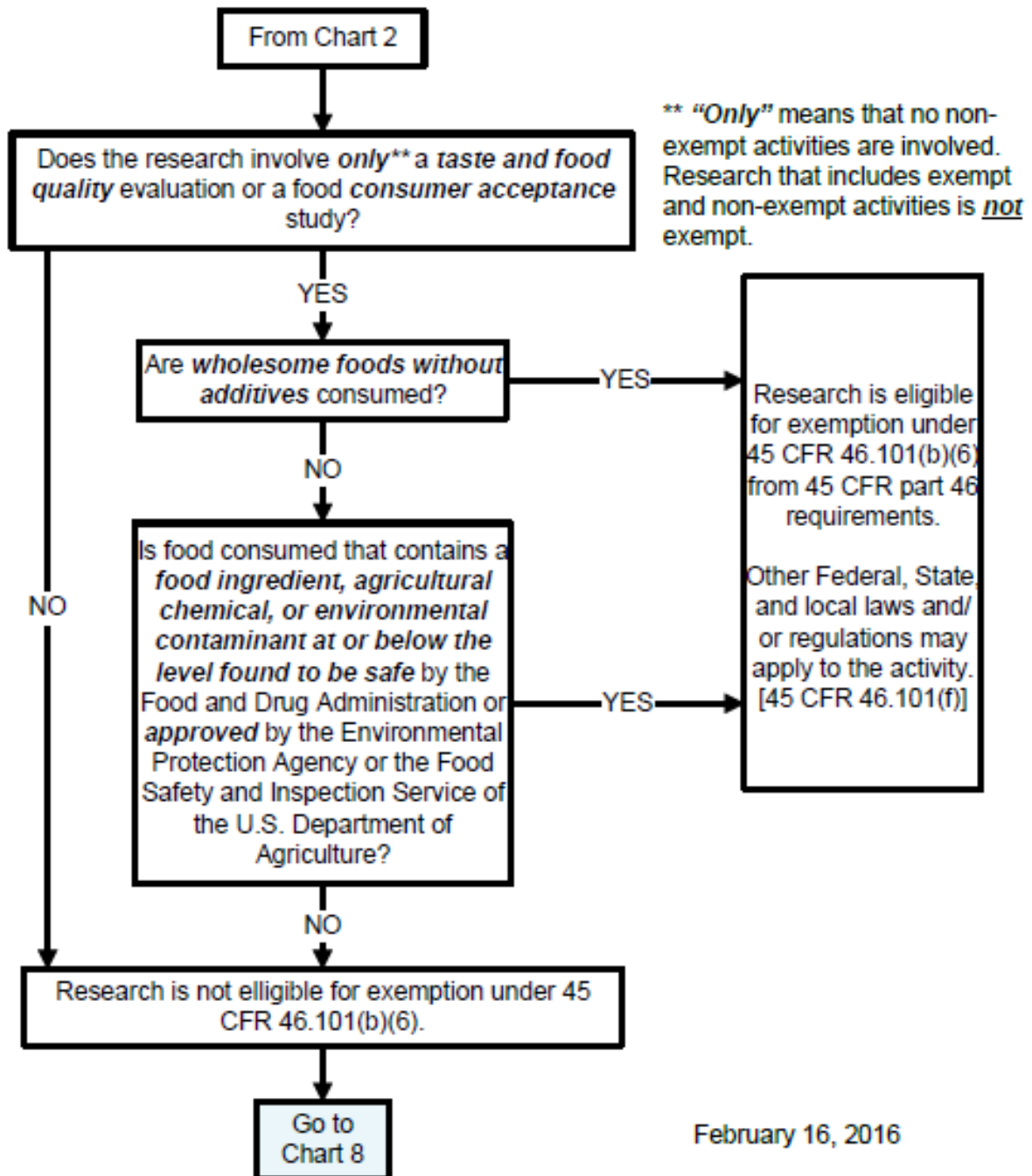
### Chart 6: Does Exemption 45 CFR 46.101(b)(5) (for Public Benefit or Service Programs) Apply?



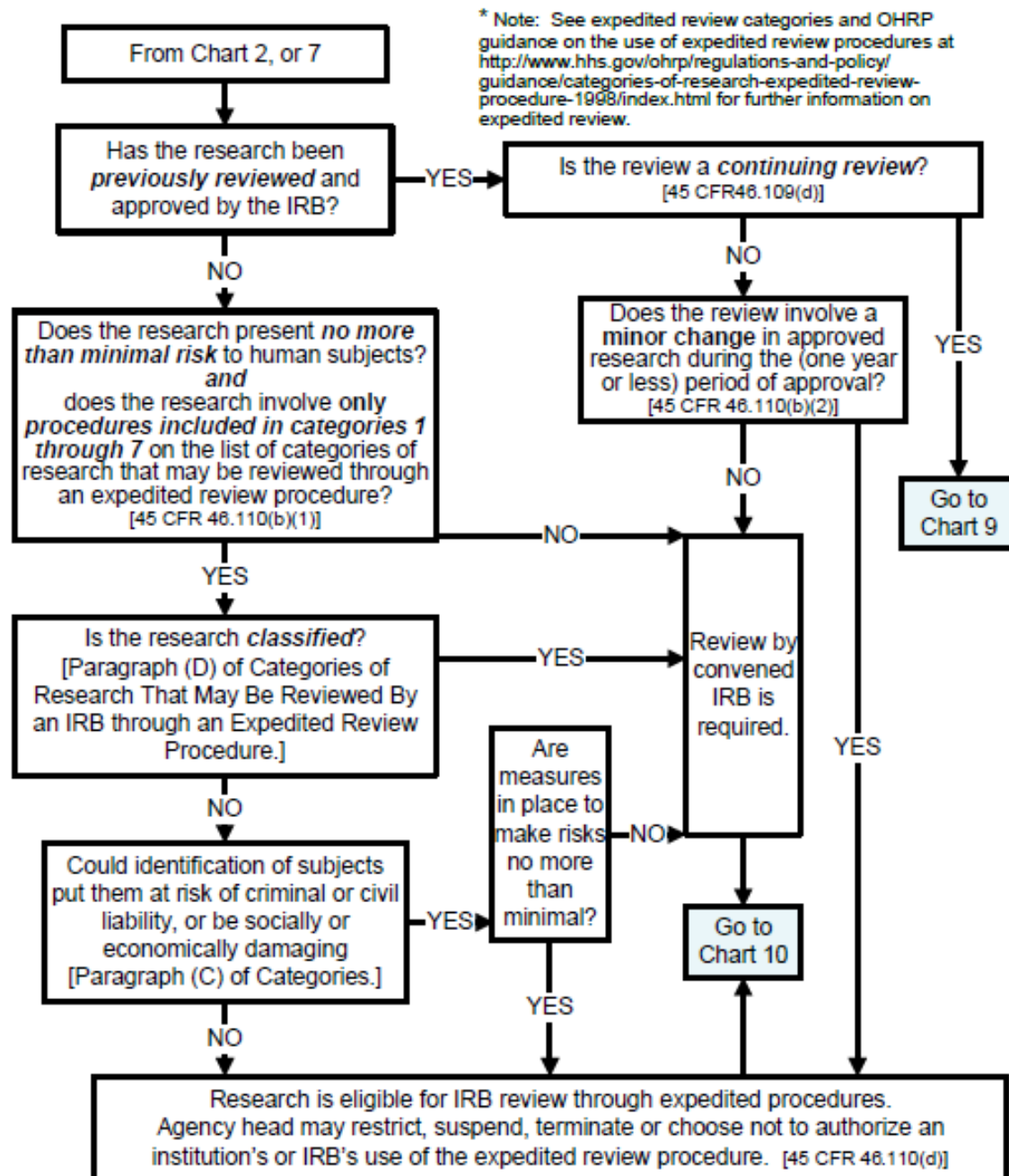
\* Note: See OHRP guidance on exemptions at <http://www.hhs.gov/ohrp/regulations-and-policy/guidance/exemptions-for-public-benefit-and-service-programs/index.html> for further description of requirements for this exemption.



### Chart 7: Does Exemption 45 CFR 46.101(b)(6) (for Food Taste and Acceptance Studies) Apply?

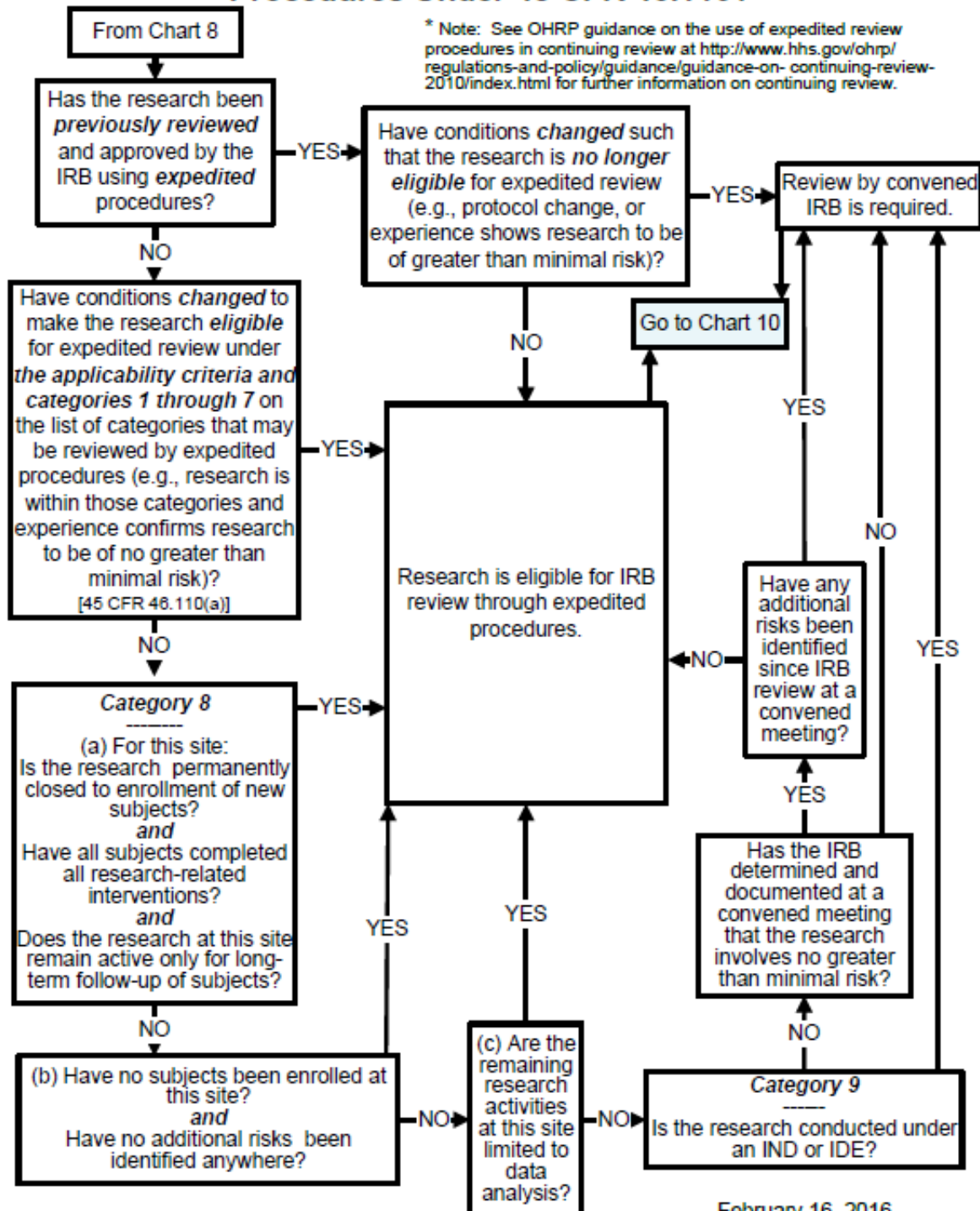


**Chart 8: May the IRB Review Be Done by Expedited Procedures Under 45 CFR 46.110?\***



February 16, 2016

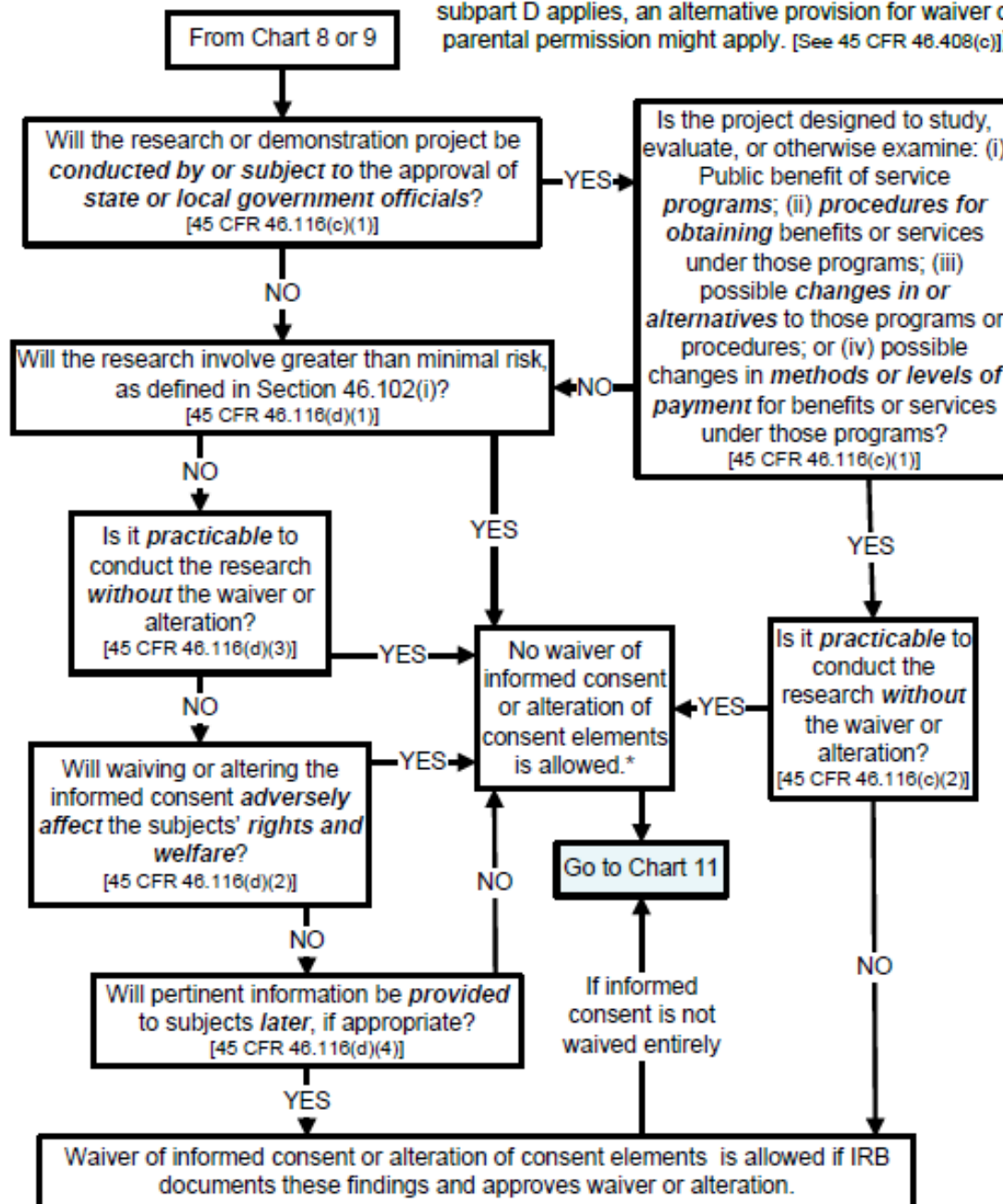
**Chart 9: Can Continuing Review be Done by Expedited Procedures Under 45 CFR 46.110?**



February 16, 2016

**Chart 10: Can Informed Consent Be Waived or Consent Elements Be Altered Under 45 CFR 46.116(c) or (d)?\*\***

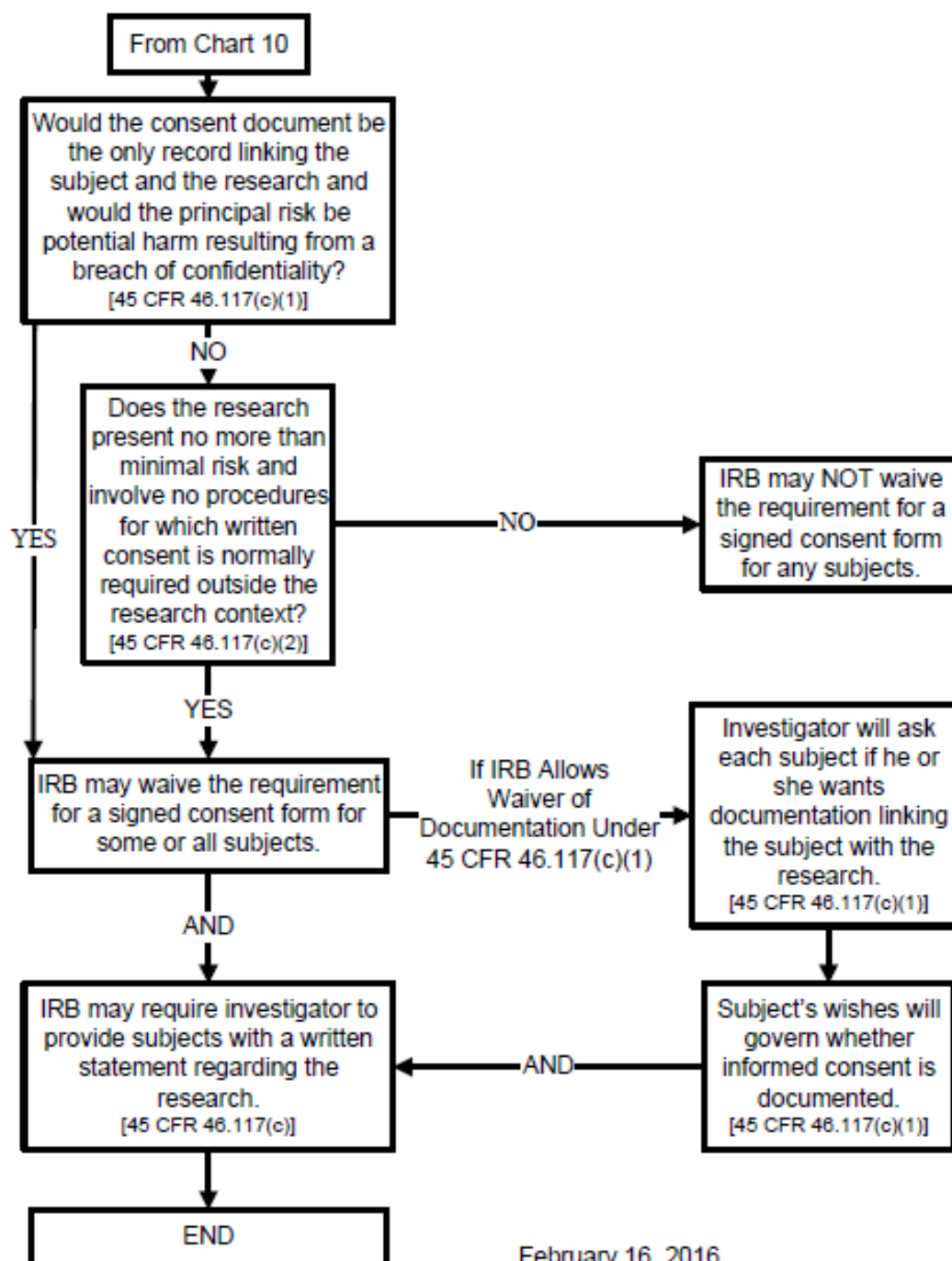
\*\* (Note: If subjects include children to whom 45 CFR part 46, subpart D applies, an alternative provision for waiver of parental permission might apply. [See 45 CFR 46.408(c)])



\* Note: See OHRP guidance on informed consent requirements in emergency research at <http://www.hhs.gov/ohrp/regulations-and-policy/guidance/emergency-research-informed-consent-requirements/index.html> for further information on emergency research informed consent waiver.

February 16, 2016

**Chart 11: May Documentation of Informed Consent Be Waived Under 45 CFR 46.117(c)?**



February 16, 2016

## Appendix B – List of Competencies Met in Integrative Learning Experience

**Wright State Program Public Health Competencies Checklist**

Assess and utilize quantitative and qualitative data.
Communicate public health information to lay and/or professional audiences with linguistic and cultural sensitivity.
Evaluate and interpret evidence, including strengths, limitations, and practical implications.
Demonstrate ethical standards in research, data collection and management, data analysis, and communication.
Explain public health as part of a larger inter-related system of organizations that influence the health of populations at local, national, and global levels.

**Concentration Specific Competencies Checklist**

<b>Health Promotion and Education:</b>	
<b>Area 1: Assess Needs, Assets and Capacity for Health Education</b>	
1.1	Identify stakeholders to participate in the assessment process
1.2	Engage stakeholders to participate in the assessment process
1.3	Analyze factors that foster or hinder the learning process
1.4	Identify factors that foster or hinder skill building
1.5	Analyze factors that foster or hinder skill building
1.6	Synthesize assessment findings
<b>Area 3: Implement Health Education</b>	
3.1	Identify training needs
<b>Area 4: Conduct Evaluation and Research Related to Health Education</b>	
4.1	Create purpose statement
4.2	Develop evaluation/research questions
4.3	Assess the merits and limitations of qualitative and quantitative data collection for research
4.4	Critique existing data collection instruments for research
4.8	Evaluate feasibility of implementing recommendations from evaluation
4.9	Disseminate research findings through professional conference presentations