A PROFILE OF UNDIAGNOSED DIABETICS IN THE COMMUNITY: RESULTS FROM THE BOSTON AREA COMMUNITY HEALTH (BACH) PRE-DIABETES SURVEY

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Background Research suggests almost 30% of the United States population has undiagnosed diabetes and that diabetics typically have the disease for 4 to 7 years before eventual diagnosis. Delay in initial diagnosis results in greater diabetes-related complications, poorer patient outcomes, and reduced quality of life. Most diabetes research is necessarily confined to diagnosed diabetes. Our objective was to identify risk factors for remaining undiagnosed.

Methods The Boston Area Community Health (BACH) Pre-Diabetes study is an ongoing community-based random-sample cohort study that has enrolled 2,974 participants to date. Participants were asked to fast for 8 hours prior to their interview. Fasting glucose (FG) and glycated hemoglobin (HbA1c) were collected during in-home interviews. Undiagnosed diabetes was defined as FG >125 mg/dL or HbA1c ≥ 6.5%. Risk factors were organized into four logical groupings: 1) socio-demographics, 2) lifestyle/behavioral, 3) utilization/access to healthcare, and 4) health status/comorbidities. Logistic regression was used to estimate the odds ratio (OR) for diagnosed vs. undiagnosed diabetes.

Results The prevalence of diabetes in the BACH study was 27.8% (n=827). 21.2% of diabetes cases were undiagnosed. The data indicated that healthcare utilization and the presence of co-morbid conditions had a large impact on diabetes diagnosis. Participants who visited a health care provider 5 or more times in the past year were 90% more likely to be diagnosed (OR=1.9, p<0.001) than participants who had 5 or fewer visits. Participants with a history of high cholesterol were more than twice as likely to be diagnosed (OR=2.7, p<0.001). High blood pressure or a history of heart disease also increased the likelihood a participant was diagnosed. Participants with a documented family history of diabetes were more likely to be diagnosed (OR=2.9, p<0.001). Finally, English-speaking participants were more than twice as likely to be diagnosed (OR=2.6, p=0.01) than their Spanish-speaking counterparts.

Conclusion Undiagnosed diabetes is a highly prevalent problem in the United States that leads to poorer patient outcomes and significant health-care costs. These results indicate that access to care, health care utilization and the presence of co-morbid conditions have an important impact on diabetes diagnosis. Individuals who do not have the traditional risk factors for diabetes (i.e. family history) have a greater risk of remaining undiagnosed. These findings suggest that improving access to care in the United States may greatly increase the likelihood of diagnosing previously undiagnosed diabetes.

THE CONTRIBUTION OF DOCTORS’ DECISIONS TO HEALTHCARE INEQUALITIES: TOWARDS FOURTH GENERATION STUDIES

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Background Healthcare variations are a worrisome and well-documented problem. Such variations occur at different levels: between health care systems, geographic areas, organizational settings, patients, and doctors. Research is increasingly focused on the contribution of doctors’ decision making to the generation or amplification of healthcare disparities. Clinical decision making studies continue to evolve through generations of work that focus on different types of influence: First generation studies identified patient-level attributes (e.g., gender, age, race/ethnicity, SES, health insurance status); Second generation studies on variations associated with physician characteristics (e.g., age, gender and education, specialty and type of remuneration); Third generation studies on health system and
organizational influences (e.g., size, profit status, location and population served, and most recently, organizational culture).

**Methods** We used a factorial experimental design in which the subjects, primary care doctors (n=192), viewed clinically authentic vignettes of “patients” presenting with identical signs and symptoms suggesting diabetes. They were stratified according to gender and level of experience. During an in-person interview, they were asked how they would diagnosis and manage the vignette ‘patient’.

**Results** After controlling for the first two levels of influence (patient and provider), each of which contributed 4.4 and 2% respectively, organizational culture significantly contributed to their behavior, accounting for 14.3% of the variation in clinical decision-making for diabetes. Considering nine different dimensions of practice culture, organizational trust and business emphasis contributed most to the variance in treatment for diabetic foot neuropathy.

**Conclusion** Attempts to reduce health care variations continues to focus on the levels of patient attributes and physician characteristics (e.g. improved educational efforts). Findings from this experiment suggest a need to further investigate the contribution of organizational factors (third generation) and suggest appropriate interventions at that level. As important however, is the consideration of a fourth generation: cognitive aspects of physician decisions. Qualitative methods (i.e. “think aloud”) and newly developing methods to objectively measure unconscious bias (e.g., the Implicit Association Test) can provide more robust assessment of what goes on “inside the doctors’ head,” which eventually produce healthcare disparities.

**HSR: General**

**THE USE OF NHS ROUTINE DATA TO ANALYSE THE EFFECTS OF HEALTHCARE INTERVENTIONS**

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1ting curedniclinic in each PCT to help improve the primary care infrastructure. These polyclinics serve as a hub for a group of GP practices which combined form a polysystem. We aimed to investigate the impact of services provided in a polysystem on unplanned (emergency) admissions, using routine NHS activity data. In one polysystem case study, a pulmonary rehabilitation service for COPD was established. In another, a diabetes patient education programme was offered.

**Methods** We used routine Hospital Episodes Statistics inpatient data from 2004/5 to 2009/10 covering around 1500 London practices. Differences in adjusted trends in emergency admission rates were compared between the polysystem GP practices case studies and other London practices. Multilevel regression models assessed standardized rate ratios, controlling for year variation, GP practice and population factors. We incorporated interaction terms to allow the effects of the polysystem to vary independently by year.

**Results** Over the study period COPD emergency admission rates fell across London with a yearly admission rate ratio of (95% CI) 0.98 (0.97, 0.99; p<0.001). The rates in the study polysystem did not differ from the rest of London at baseline and there was not enough evidence to suggest that the introduction of the polysystem service in May 2007 had any effect on the admission rates. A total of 12% of the registered COPD population was seen as new contacts in the first year of the service.

Diabetes emergency admission rates have been falling across London over the study period with a yearly admission rate ratio (95% CI) of 0.98 (0.96, 0.99; p<0.001). In the first year of the diabetes intervention, the rate of emergency admissions for diabetes fell by 80% in patients from the polysystem practices compared with London, with an interaction factor (95% CI) of 0.20 (0.13, 0.31) p<0.001 and this fall was maintained in the following year. Intervention in this London Polysystem covered 70% of the diabetic population. The power to detect an effect was increased due to the coverage.

**Conclusion** NHS routine data can be used to assess the impact of health service interventions that are aimed at reducing admissions. Commissioners must be aware that to assess the impact of interventions, the implementation needs to be on a large scale and that medium term follow up is required in order to study the trends.

**DISCRIMINATING CLINICAL OUTCOME MODELS MAY DRIFT UNACCEPTABLY: EXAMPLE OF CARDIAC SURGERY MORTALITY**

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**Methods** We used a factorial experimental design in which the subjects, primary care doctors (n=192), viewed clinically authentic vignettes of “patients” presenting with identical signs and symptoms suggesting diabetes. They were stratified according to gender and level of experience. During an in-person interview, they were asked how they would diagnosis and manage the vignette ‘patient’.

**Results** After controlling for the first two levels of influence (patient and provider), each of which contributed 4.4 and 2% respectively, organizational culture significantly contributed to their behavior, accounting for 14.3% of the variation in clinical decision-making for diabetes. Considering nine different dimensions of practice culture, organizational trust and business emphasis contributed most to the variance in treatment for diabetic foot neuropathy.

**Conclusion** Attempts to reduce health care variations continues to focus on the levels of patient attributes and physician characteristics (e.g. improved educational efforts). Findings from this experiment suggest a need to further investigate the contribution of of organizational factors (third generation) and suggest appropriate interventions at that level. As important however, is the consideration of a fourth generation: cognitive aspects of physician decisions. Qualitative methods (i.e. “think aloud”) and newly developing methods to objectively measure unconscious bias (e.g., the Implicit Association Test) can provide more robust assessment of what goes on “inside the doctors’ head,” which eventually produce healthcare disparities.