

## **Attachment 1: Project Background and References**

Cancers found and treated at earlier stages may result in extended life, less intensive therapies (Henley, King, German, Richardson, & Plescia, 2010), lower costs (Campbell & Ramsey, 2009; Taplin et al., 1995), and less emotional and psychological burden on patients (Simon, Thompson, Flashman, & Wardle, 2009; Vodermaier, Linden, MacKenzie, Greig, & Marshall, 2011), compared with later-stage cancers. Early detection may be accomplished when asymptomatic individuals are screened for cancer or when individuals report signs and symptoms of cancer to their providers and treatment commences when the disease is at an early, more treatable stage. This project focuses on the latter.

Low awareness of signs and symptoms has been identified as one contributor to late stage cancer diagnoses (Macleod, Mitchell, Burgess, Macdonald, & Ramirez, 2009; Ramirez et al., 1999). If people are not aware of signs and symptoms of cancer, they may be more likely to delay consulting a health care provider until the symptoms are more evident (Courtney et al., 2012; Meechan, Collins, & Petrie, 2003). These delays result in cancers diagnosed in the later stages of disease development when treatment may be less effective and survival rates may be lower (Richards, Westcombe, Love, Littlejohns, & Ramirez, 1999).

Especially for symptomatic cancers, such as colorectal cancer (Courtney, et al., 2012), patients who understand what symptoms and body changes are important and report them to health care providers may improve their survival chances. Some research has explored why individuals delay reporting symptoms and/or seeking care for cancer. In addition to access and financial barriers, awareness and beliefs have been implicated in small studies as factors associated with the timing of care-seeking. For example, pessimistic beliefs about cancer's curability may lead to delayed reporting to providers (Chojnacka-Szawlowska, Koscielak, Karasiewicz, Majkowicz, & Kozaka, 2012).

Using breast cancer as an example, women's prompt report of symptoms to providers were associated with a recognition of the disease's signs as well as beliefs about treatment (Burgess, Hunter, & Ramirez, 2001). Although breast cancer is one of the few cancers with a recommended screening, symptom reporting remains a critical component of early detection and treatment. Fast-growing tumors are often found by the woman herself, not a screening mammogram (cite), thus it is important that women recognize signs and symptoms that should be reported to their health care providers. Delays may explain, to some extent, disparities in cancer outcomes by race, ethnicity, and income, such as those seen in breast cancer (Bibb, 2001). African American women have a lower incidence rate of breast cancer but a higher mortality rate from the disease compared to white women in the United States (American Cancer Society, 2012), despite similar rates of mammograms reported. Among the many biological and behavioral hypotheses for the disparity is that African American women present symptoms to health care providers at a later stage (Maly et al., 2011). Beliefs about cancer, such as perceptions of treatment and survival chances, in addition to access barriers and religiosity may influence women to delay seeking care until the disease has progressed. This disparity and others like it may be addressed, in part, through increased patient education.

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