DESIGN FOR HEALTH

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Key Questions:

Mental Health

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Version 2.0

DESIGN FOR HEALTH is a collaboration between the University of Minnesota and Blue Cross and Blue Shield of Minnesota that serves to bridge the gap between the emerging research base on community design and healthy living with the every-day realities of local government planning. This Mental Health Key Question is part of a series with a focus on identifying and interpreting evidence-based research linking public health with planning.

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Overview

For some decades, research has examined the restorative effects of nature on mental health. A strong research base has continued to demonstrate how direct contact with nature (water, trees, bushes, flowers, and other vegetation, whether cultivated or wild) leads to increased mental health and psychological development. In general, research looks at how urban-dwellers are influenced by nature through "everyday experiences" that include viewing nature and/or being in green spaces (Maller et al. 2005). Long-term collaborators Rachel and Steven Kaplan focused attention on four key elements for restorative environments: a sense of fascination, a sense of getting away, complexity, and compatibility between the environment and the user's preferences (Kaplan 1995).

To explore this link between nature and people, researchers have studied a variety of individuals, including hospital patients, nursing-home residents, military personnel, workers in windowless offices, viewers of horror films, prisoners, college students, office workers, and car drivers [1]. Benefits from contact with various types of green spaces and views have included: better test scores; fewer illnesses; positive effects on physiological measures, such as heart rate, skin conductance, muscle tension, and pulse rate; use of fewer painkillers; and shortened hospital stays [2].

Recent data shows that depression and other mental health disorders will account for some of the world's largest health problems in upcoming decades (Maller et al. 2005, 45-6). The connection between nature or green space and mental health has implications for planning and designing parks, streets and yards.

Things for certain (or semi-certain)

- A variety of different theories focus on different aspects of the psychological benefits that are linked to nature experiences; all have shown that nature experiences are desirable and healthy.

  Example: One study measured the physiological responses (heart rate, skin conductance, muscle tension, etc.) of 120 undergraduates from the University of Delaware before and after they watched a horror movie. Immediately following the screening, they were exposed to one of six urban or natural settings. Results showed that the recovery was faster when the students were exposed to more natural scenes (Ulrich et al. 1991).

- People, in general, prefer natural environments to urban ones; however, these studies have typically contrasted unvegetated complex urban scenes with more tranquil natural ones. It seems that people prefer scenes that are moderately complex and scenes of greenery have that character.

- People do not have to actively use nature to benefit from it; rather, looking at nature provides enough exposure to effect changes in mental health.

  Example: One survey of 168 public-service employees compared job satisfaction and work-related stress levels with whether or not the worker had a view of natural elements from his or her work station. Results show that those with similar jobs reported less ailments and were more likely to be satisfied with their jobs if they had a view of nature (Kaplan and Kaplan 1989).

  Example: A 10-year study of gallbladder patients compared the recovery rates of those who had a view of parks and trees from their bed and those who had a view of a brick wall. Results showed that those with a view of parks and trees recovered faster, requested fewer painkillers, stayed shorter periods in the hospital, and had fewer post-operative problems (Ulrich 1984).

Example: A comparison study of Michigan prison inmates looked at changes in stress levels based on one group who had a view of farmland and another group who had a view of a prison yard. Results showed that there was a lower stress level for those with a view of the farmland, as defined by fewer reports of digestive problems, headaches and sick calls" (Moore 1981; Maller et al. 2005).

Example: In a study focused on the relationship between drivers and their surroundings, participants simulated a drive where they were exposed to one of four different types of roads: forest-rural scenery, golf courses, mixed roadside scenery, and urban environments. Results showed reduced stress levels were experienced by those exposed to more natural environments (Parsons et al. 1998; Maller 2005).

Things up in the air

- It is not always clear which aspect of nature is most relevant or has the strongest impact; research has explored myriad encounters with nature, including extended wilderness excursions, hiking in open space, strolling through a city park, gardening, tending a small plot of urban grass or a vacant city lot with its attendant ecosystem, and even watching nature scenes on television.

- While the maintenance of natural areas within communities (parks, plazas, landscaped areas, etc) is important across all user groups, it does mean different things to different users as preferences range from high-maintained areas to a wilder look (Talbot and Kaplan 1984).

  Example: One study did interviews with 100 low-income African Americans in focus groups. It focused on feelings of safety with regards to tree density. The authors discussed how "trees may affect sense of safety in two opposing ways—both decreasing sense of safety through decreasing view distances and increasing sense of safety through increasing the civilized, cared-for character of a space" (Kuo et al. 1998, 555).

- It is not always clear how sub-populations respond differently to natural environments. There are, in fact, significant differences among groups by age, place of residence, ethnic heritage, country of birth, etc. (Forsyth and Musacchio 2005).

  Example: A survey of 140 seventh- and eighth-grade students (60 who were Black and 71 who were white) looked at preferences for natural settings in terms of ethnic and age variation. Results showed that generally the white sub-sample preferred undeveloped or unmanicured appearances, while the Black subsample did not (Talbot and Kaplan 1993).

  Example: Interviews were conducted with 97 Detroit residents who lived in moderate- to low-income neighborhoods. They were asked to rate 26 natural areas, as well as to identify which characteristics were preferable and which were not. The results showed that well-maintained areas were preferred over densely wooded areas (Talbot and Kaplan 1984).

  Example: One study interviewed 898 Black, Latino, Asian, and white people about park management (Gobster 2002). Groups differed in the attribute they favored. "Asians mentioned the park's scenic beauty more often than other groups, Latinos the cool refreshing 'lake effect,' and whites the trees and other park vegetation. Blacks said less about the natural environment, instead focusing on facilities and maintenance aspects, park activities, the zoo, and sports orientation. Rank order correlations showed that Asians and Latinos had the most similar preferences, while Blacks and whites had the least"(Gobster 2002, 151).

- Most research also seems to vary in terms of their definition of urban, which makes it difficult to ascertain how nature can affect different categories of varying densities.

- The "amount" or "size" or "quantity" of green space differs from study to study, making it somewhat difficult to figure out thresholds associated with nature and the built environment. This may make design standards

more important than particular thresholds. Small amounts of green, however, seem to have benefits.

Example: On hundred people in a low-income, African-American neighborhood were surveyed about their reactions to visual simulations of 0, 12 and 22 trees per acre in the open areas of their public housing development. Results showed that residents responded most positively to 22 trees per acre in terms of their own personal preferences and perception of safety (Kuo et al. 1998, 45).

Example: Another study convened seven different groups, each between 13-28 people, who looked at photographs of landscapes from two Midwestern community parks in the suburbs of Chicago. While the preferred density varied between the different observer groups, the difference was slim, as the range ran between 50-65 trees per acre (Schroeder 1986). It should be noted that subjects included a large portion of people in environment-related fields (arboretum workers, park-district staff, horticulture students), who may tend to have different preferences to the general public.

Maller et al. (2005) provide a useful review of this literature in an article entitled, "Healthy nature healthy people: 'contact with nature' as an upstream health promotion intervention for populations." It provides a helpful table that breaks down evidence into categories of anecdotal, theoretical and empirical. This Key Questions sheet relied heavily on this resource, in addition to the other studies cited.

Working thresholds for HIA

Provide views of green spaces, with canopy trees, from all buildings. These can be trees at the street level or, for upper-level situations, views to parklands, etc. Tree densities with greater than 22 trees per acre have a positive effect in terms of presence and sense of safety in a population of low-income, public-housing residents (Kuo et al. 1998, 45). This is not a very high density of trees.

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Notes

1. Maller et al. published a literature review that showcased the link between contact with nature and health. The review lists a series of sub-groups that have been studied to examine this link. Ulrich (1984) compared the recovery rates for gallbladder patients who had a view of nature from a window with those who did not. Kaplan and Kaplan (1989) conducted a series of studies of comparable workers who had windows in the workplace and those who did not. Ulrich (1991) developed a study that compared physiological measures of students who had watched a horror movie and were then either shown slides of natural or urban environments. Moore (1981) conducted research in a prison where cell windows with a view of nature led to decreased levels of symptoms associated with stress. Tennessen and Cimprich (1995) recorded the test scores of students who had natural views and those who did not. Parsons et al. (1998) looked at the effects that roadside environments had on car drivers by documenting physiological changes. All of these studies showed that interaction with nature had a direct link to health.

2. Benefits from contact with various types of green spaces and views have included: better test scores (Tennessen and Cimprich 1995), fewer illnesses (Kaplan and Kaplan 1989), positive effects on physiological measures: heart rate, skin conductance, muscle tension, pulse transit time (Ulrich et al. 1991), use of fewer painkillers (Ulrich 1984), and shortened hospital stays (Ulrich 1984).