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Spatial mismatch problem of childcare in Tokyo

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Abstract

This paper examines childcare centers’ spatial mismatch problem—a geographic mismatch that impedes a balance between work and childrearing. The study area is Tokyo, which has a large and growing number of children on childcare waiting lists. Survey results indicate the importance of spatial proximity and access to childcare centers in achieving the desired balance between work and childrearing. Visualized accessibility shows a considerable geographic mismatch between the supply and demand of childcare centers, especially for smaller children aged 0–2 years. Resolving the spatial mismatch problem can be a key policy.

Keywords: spatial mismatch; childcare centers; accessibility; GIS; Tokyo;

1. Introduction

Improving the balance between work and family is an important policy objective in many countries. The lack of childcare services is often reported as a problem affecting this balance. This problem is especially serious in Japan, which has a large number of children on waiting lists for licensed daycare centers. Childcare queues arise due to not only the lack of supply but also the geographic mismatch between supply and demand. Little attention, however, has been paid to the accessibility of childcare centers. By extending Kain’s traditional spatial mismatch theory [1], I examine the spatial mismatch problem of childcare, defining it as the geographic mismatch between the supply and demand of childcare centers that impedes a balance between work and childrearing. Specifically, the following two questions are addressed. First, is access to childcare centers important in achieving the desired balance between work and childrearing? Second, does a geographic mismatch exist between the supply and demand of childcare centers, and does it differ by age?

The study area comprises Tokyo’s 23 special wards, which have a large number of children on childcare waiting lists. In this study, I differential between geographic and spatial mismatch to avoid
confusion. The former indicates a purely locational mismatch, but the latter implies that the geographic mismatch hinders a desired balance between work and childrearing.

2. Methods

To answer the first question stated above, I conducted an Internet-based questionnaire survey. The survey was carried out in 2009, between November 20 to 25, among 650 mothers with preschool children living in the Tokyo’s ward area; 311 mothers responded to the questionnaire. Mothers are selected because they are most likely the primary carers in households and probably face more space-time constraints than men [2]. Further details about the survey are documented in [3].

As regards the second question, the accessibility of childcare centers, which indicates the geographic mismatch of their supply and demand was calculated and visualized for each age group. The accessibility is calculated at the basic unit block—a spatially micro area—with the help of detailed spatial data and a geographic information system (GIS). Age-wise differences are examined since childcare queues are known to differ considerably by age. The accessibility for a resident block \( i \) \( (A_i) \) is calculated with the following equation:

\[
A_i = \sum_{j, d_{ij} < d_0} \frac{S_j a}{\sum_{k, d_{kj} < d_0} r a P_k}
\]

where \( a \) is the age of children; \( S_j \) the supply of a childcare center \( j \); \( d_{ij} \) and \( d_{kj} \) the respective distances by road between resident blocks \( i \) and \( k \), on the one hand, and a childcare center \( j \), on the other; \( d_0 \) the threshold distance for commuting to childcare centers; \( r \) the ratio of those requiring childcare centers to the whole population; and \( P_k \) the population in a resident block \( k \). The accessibility value obtained from equation (1) represents the supply-demand ratio of childcare centers that incorporates spatial competition. An accessibility value of 1 represents a supply-demand balance, whereas a value greater or less than 1 indicates excess supply or demand. Note that the population-weighted value of accessibility calculated for each basic unit block equals the supply-demand ratio of childcare centers for the whole area (the Tokyo ward area).

As for the supply of childcare centers \( (S_j) \), I used the following three types of childcare centers’ capacity as of April 2009: licensed daycare centers \( (Ninka-hoikujo) \), TMG-certified daycare centers \( (Tokyo’s ninsyo-hoikujo) \), and authorized childcare centers \( (Nintei-kodomoen) \). The distance by road between a basic unit block and a childcare center \( (d_{ij} \) and \( d_{kj} ) \) is calculated using the 2009 road network data and ArcGIS9.3 of ESRI Japan, Inc. Here, the location of a basic unit block is the centroid of that block. The ratio of the population requiring the three types of childcare centers \( (r) \) is set at 20% for 0-year-olds and 35% for children aged 1 year and older. The population \( (P_k) \) used is the population estimated by basic unit block. As regards the threshold distance to childcare centers \( (d_0) \), I used 500, 750, and 1,000 meters; [4] and [5] use half a mile, or about 800 meters, as the threshold. Assuming a walking speed of about 50 meters per minute, with small children in tow, as in [6], the three thresholds are approximately 10, 15, and 20 minutes on foot, respectively. According to [7], the actual and preferable travel time to and from childcare centers is about 10 minutes or less.

3. Results

Survey results indicated the importance of spatial proximity and access to childcare centers in achieving the desired balance between work and childrearing. Of respondents who wish to use childcare centers, almost all (96%) answer that proximity from home is “very important” (79%, the predominant group) or “important” (17%). Most users (77%) select childcare centers that can be accessed within
approximately 10 minutes, and almost all (98%) are serviced by centers accessible in about 20 minutes. These results suggest that long access times to childcare centers are not feasible.

A striking finding is the considerable discrepancies between the current and desired employment statuses. The majority (57%) of the respondents are housewives, but most (87%) wish to work. Among the reasons for not being able to realize the desired employment statuses, “impossibility or difficulty to use childcare centers” accounts for a notable proportion (26%). During the waiting period for enrollment in desired childcare centers, 71% answer that balancing work and childrearing became “very difficult/unstable” (41%) or “difficult/unstable” (30%). In fact, 27% were forced to quit their jobs, and 1% fired. Since these two choices do not overlap, 28% were constrained to leave their jobs although they wished to continue working.

Visualized accessibility of childcare centers by basic unit block revealed a considerable geographic mismatch in the supply and demand of childcare centers, especially for smaller children aged 0–2 years. In general, blocks with low accessibility show the following three patterns. First, no childcare centers exist nearby (within the commuting threshold). Second, centers nearby do not provide care for a particular age group. Third, demand exceeds supply for a particular age group, although centers nearby do provide care for that age group. Further details about the survey and accessibility results are presented in [8].

4. Conclusions

This study examined the spatial mismatch problem of childcare—the geographic mismatch that impedes the balancing of work and childrearing. The study was conducted for the Tokyo ward area, which has witnessed a remarkable growth in the number of children on childcare waiting lists. The survey results indicated the importance of spatial proximity and access to childcare centers in achieving the desired balance between work and childrearing. Visualized accessibility revealed a considerable geographic mismatch in the supply and demand of childcare centers, especially for smaller children aged 0–2 years.

Three policy implications are drawn from the findings. First, improving the accessibility of childcare centers helps to balance work and childrearing, which in turn leads to female participation in the labor force. Second, improving the accessibility of childcare centers for smaller children will not only help reduce the number of children on waiting lists but also allow parents to continue working. Third, resolving the geographic mismatch of the supply and demand of childcare centers is a key approach to the development of childcare centers.

This study is limited to descriptive analysis. A statistical examination of the extent to which better access to childcare improves the balance between work and childrearing is a topic for future research.

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References


