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National Institute of Justice United States Department of Justice Washington, D.C. 20531



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Prison Standards: Some Pertinent Data on Crowding*

BY PAUL PAULUS, GARVIN MCCAIN, AND VERNE COX Psychology Department, University of Texas at Arlington

HE PROBLEM of crowding in prisons is becoming increasingly acute. During the next decade many prison systems will be faced with important and potentially expensive decisions regarding prison housing. In some cases these decisions will be prompted by judicial action. Reduction of crowding in prisons will involve decisions regarding space, inmate density, and institutional size. In the recent Rhodes v. $Chapman^1$ decision the court displayed a reluctance to accept unsupported expert testimony on crowding when such testimony was challenged by empirical data (No. 80-332, p. 11, see also pp. 4, 10). Obviously, such decisions will require a sound data base. It is our hope that data we have gathered during the last 10 years will have a positive impact on decisionmaking directed toward reduction in prison crowding. Our research has convinced us that solutions to prison crowding lie not only in increasing available living space but also in reducing the influence of the number of people in living areas. Recent revisions of prison housing standards designed to relieve crowding have emphasized available space. In our opinion, considerable reduction in crowding effects can also be achieved by reduction of number of people in multiple occupant open housing. For example, we believe that increasing living space in open dormitories is less effective than dividing existing space into cubicles even though the space per person may remain unchanged or even decline. The primary purpose of this article is to describe the results of our past

*The data in this article were gathered under a grant (78-NI-AX-0019) from the National Institute of Law Enforcement and Criminal Justice, Law Enforcement Assistance Administration, U.S. Department of Justice. Points of view are those of the authors and do not necessarily represent the official position or policies of the U.S. Department of Justice. The authors are professors of psychology at the University of Texas at Arlington. research on the effects of crowding in prisons. Much of this research was funded by a grant from LEAA for the study of crowding in prisons and is described in detail in a recent report (McCain, Cox & Paulus, 1980).

Many prisons, even though extremely crowded, are not suitable for research primarily because of a limited variety of housing within the institution. In our search for prison research sites we have visited over 40 institutions and have collected data from 10. In addition to onsite prison research, we have had access to substantial archival data from three large state systems. Table 1 provides descriptions of the various research sites.

Our choice of measures to access crowding reflect practical considerations associated with working in a prison environment. These considerations led us to employ measures that could be obtained from records or required little of the inmates' time. We placed particular emphasis on illness conplaint rates and questionnaires that focused on mood state, ratings of the physical and social environment, and measures of perceived crowding. We have also obtained substantial archival data related to suicides, deaths, psychiatric commitments, and disciplinary infractions from the Texas, Oklahoma, and Illinois prison systems. These data span many years and encompass substantial variations in overall prison population levels.

Social and Spatial Density

Our measure of social density is the number of individuals in a sleeping unit. Spatial density reflects space per person in a sleeping unit. Quite often it is difficult to separate the effects of social Institution

Texarkana FCI

La Tuna FCI

Danbury FCI

El Reno FCI

Atlanta FCI

Fort Worth FCI (Coed)

Stateville

Dallas County Jail

and spatial density since these typically change in the same direction. For example, converting a single cell to a double cell increases both social and spatial density. In spite of this problem we have been able to find situations where social and spatial density were relatively independent.

Social Density

One of the clearest findings of our research is that increased social density is accompanied by increased feelings of crowding, negative reactions to the living environment, and higher illness complaint rates for contagious and noncontagious illnesses. One consistent finding from our research has been the observation that illness complaint rates in dormitories have been approximately twice as high as in single cells. As can be seen in figure 1, the increase in illness complaint rates is relatively constant as social density increases. This figure represents data from about 1,400 inmates in the six Federal institutions described earlier. Spatial density remained relatively constant over those social density values.

We do not have sufficient data to be sure of the effect of large dormitories as compared to smaller dormitories of equivalent spatial density. However, our data from the Dallas County jail, together with some limited prison data, suggest

SOME PERTINENT DATA ON CROWDING

TABLE 1

Security Level	Approximate Total Population	Housing Types
Medium	500-700	small singles, large singles, doubles, open dorms
Medium & Minimum	700	doubles, large open dorms, 4 bunk cubicles
Medium	670	singles, double cells & cubicles, open dorms
Medium	1200	single & double cells, single & double cubicles
Maximum	2000	Single and double cells & 3,4,5,6 occupants in 8-man cells
Minmum	600	several size single & double cells, cubicles and open dorms
Maximum	2400	singles, doubles, triples & 6- occupant cells
	885	several sizes of multiple occupant cells arranged in tanks

that larger dormitories do produce higher illness complaint rates than smaller dormitories.

We attribute the higher illness complaint rates and other negative effects associated with higher social density to the stress engendered by increased social contacts of uncertain outcome. We have recently reviewed findings regarding the relations between illness and crowding (Cox, Paulus, McCain & Karlovac, in press). The literature supports the contention that crowding produces stress, and consequently stress-related illness. However, illness complaints cannot be viewed exclusively as a reflection of physical health status. Such behavior may also reflect increased attention to physical status, irritability, and attempts to cope with stress.

Spatial Density

The amount of space individuals have in living quarters is an important consideration in many housing standards. This reflects the presumption that a certain amount of space is necessary for psychological and physical health. Much of the support for such standards is derived from epidemiological studies indicating increases spread of contagious illness in cramped living environments (Cox, Paulus, McCain & Karlovac, in press). Yet there has been little evidence that con-

¹Rhodes v. Chapman, 49 U.S. 80-332.





striction of space has additional negative consequences beyond facilitation of contagious disease. Other consequences might be expected on several bases (cf., Paulus, 1980). For example, living environments with very little space require individuals to be in very close proximity to each other. This could lead to violations of personal space and difficulty in maintaining one's own "territory." Consequently, one might expect that individuals living in spatially crowded housing will as a consequence of psychological stress display negative reactions to their environment such as higher illness rates. We have found some general support for this supposition. We separated the contribution of social density from variations in spatial density in an analysis of illness complaint rates and found a moderate relationship between spatial density and illness complaint rates. We have consistently found inmate ratings of crowding strongly related to spatial density. These results indicate that decreases in space in a living environment produce negative psychological and physical consequences that are independent of variations in number of people.

At two institutions we were able to compare inmates living in two different size single cells. In one institution 60 square foot cells were rated more favorably than 50 square foot cells. At another, 66 square foot and 54 square foot cells did not vield differential psychological reactions. The spacious cells at this institution adjoined the spacious open dormitory and this may have mitigated the potential positive effects of the additional space. At this point we do not have convincing and consistent evidence to support the notion that small variations in space in the 50 to 66 square foot range (while holding social density constant) will have a negative impact.

Changes in Population Without Changes in Facilities

We have a substantial body of data from several correctional systems where populations have fluctuated over a period of several years. Since facilities remained relatively constant over these periods, housing was necessarily more crowded at certain times. However, it is not possible in these cases to determine which component or combination of components of crowding is responsible for effects related to crowding.

Our first finding related to increases and decreases in population came from a state psychiatric institution which had a large percentage of inmates who were over 50 years of age. The data cover the period from 1953 to 1968 and are FIGURE 2.—Death rates as related to total population in a psychiatric prison.



shown in figure 2. As total population increased, death rates per 100 inmates increased; as population decreased, death rates decreased. The death rates in the high population years were as much as 10 times higher than in low years. We also have death data from three complete prison systems for periods of 5 to 14 years. We examined violent deaths, suicides, and deaths from natural causes. In one case, suicide rates were as much as 24 times as high during high population years as compared to low population years. Increases in death rates from natural causes were found primarily in inmates over 50 years of age. Suicides were not confined to any particular age group. We interpret these changes in death rates to be related, at least in part, to crowding-induced stress.

We also have limited data on psychiatric com-The Court's conclusion was limited to one inmitment rates. We examined data from two very stitution and its generality to other institutions large prisons representing a period of 20 years. and levels of crowding is uncertain. It seems likely There was a clear relationship between an increase that the judiciary will continue to be concerned in population and an increase in psychiatric comwith the issue of crowding and violence. We have mitment rates. recently obtained some pertinent data from a Finally, we have data on disciplinary rates from Southern state prison. A Federal court ordered the a very large prison system for a 10-year period. Ussystem to provide a minimum of 50 square feet per ing the initial population years for comparison, the person which was achieved by reducing unit disciplinary infraction rates for the high popula-

populations by 25 percent. The result was a 64 pertion years were approximately five times as great

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SOME PERTINENT DATA ON CROWDING

as in the low population years. Other investigators (Megargee, 1976, 1977; Nacci, Teitelbaum & Prather, 1977; Bruehl, Horvat and George, 1979; and Farrington & Nuttell, 1980) have also found increased rates of disciplinary infractions, recidivism, escape attempts, and violence in crowded conditions.

With regard to crowding and violence, in the Rhodes v. Chapman decision the Supreme Court concluded that crowding related to double celling did not increase inmate violence. "As to violence the court found that the number of acts of violence at SOCF had increased with the prison population, but only in proportion to the increase in population. Respondents failed to produce evidence establishing that double celling itself caused greater violence. ... " P.4. Also see pp. 10 and 11.

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cent reduction in the rate of inmate assaults, and a comparable reduction in rate of inmate killings. A similar relationship was found for suicide attempts and self-mutilations.

The Effects of Institution Size

Assessing the effects of the size of total institutional population presents very difficult problems. Units may vary according to local administration, age of inmates, security level, internal crowding, location and other factors. We have data from a very large correctional system in which we could compare units below 1,100 (average approximately 800) and over 1,450 inmates (average approximately 1,600). These units were comparable with regard to internal crowding and types of housing. The data on deaths and suicides included both an official listing of each case by name, date and identification number, and copies of the death certificates. We did not find factors such as ethnic or social identification, inmates ages, security level, and dormitory or cell housing to be related to these effects. Figure 3 shows the rates of suicides for age groups ranging from 17 to 45. The number of inmates over 45 was too small for analysis. The overall suicide rate was approximately 10 times

higher in the large units compared to the small units.

Using the same age groups and other procedures as in the case of the suicide analysis we compared the large and small units on death rates excluding deaths due to suicide, violence, and accidents. The data are compatible with the suicide results, however, the differences were not as great. Large units had 59 percent higher death rates than the smaller units. We also compared psychiatric commitment rates and incidents of self-mutilation and/or attempted suicide rates. The results of the comparisons were in agreement with the suicide and death rates. The psychiatric commitment rates were 1.71 times higher in the large units. The attempted suicide and/or self-mutilation rates were 2.35 times higher in the larger units.

Social Disorganization

A number of underlying factors such as fear, loss of control, excessive stimulation, privacy, and territoriality have been presented to explain effects of social density and unit size (Paulus, 1980). Yet, to date there is insufficient evidence to indicate which of these factors or which combination of factors may be contributing to the negative effects

observed. One important variable that may be desirable quarters (McCain, Cox & Paulus, 1980). related to several of these factors is social This finding is compatible with the idea that entry disorganization. Social organization can range into new quarters represents social disorganizafrom tightly knit groups where roles and expectation for the individual, resulting in increased tions are well understood to complete disorganizastress. tion with no clear roles or expectations. It is our We have speculated that entry into an open dorhypothesis that with all other factors equal, the mitory should present the individual with greater degree of disorganization will be positively related problems in becoming a part of a stable social to the degree of observed negative effects organization as compared to an individual enterassociated with housing conditions. We would aning a single cell. On this basis we would expect that ticipate that the negative effects of disorganization the drop in illness complaint rates should be much are most likely to be observed under several condisteeper for those entering single cells. In looking at a substantial body of data from several institutions: (1) When a group of strangers are brought together. (2) When the number of individuals is too tions we have in fact found this to be the case. large to constitute a cohesive organization. This is likely to be the case in large institutions or large **Conclusions and Recommendations** housing units. (3) When there is a high incidence of strange individuals introduced into a group or a The most straightforward conclusion that can be drawn from our reported research is that both the amount of space and the number of residents must

constant change in individuals available for group formation. Our speculation about social disorganization be considered in assessing the suitability of prison began with a recent study (Lobb & McCain, 1978) housing. Most prison standards emphasize the which suggested social disorganization as a possiamount of space rather than the number of inmates ble contributing element in effects related to social in one's unit. Yet we have found that negative reacdensity and unit size. Megargee (1977) observed a tions increase both as space is reduced and as the penal institution during periods when there was number of inmates in the housing unit increases. substantial changes in total population and hous-Of special interest recently has been the issue of ing assignments. During periods of increased double celling. We have found that double cells produced more negative psychological reactions crowding and change in housing assignments the incidence of disciplinary infractions increased. than single cells. However, since all of the double In order to test our notion of the role of social cells we encountered involved assigning two men disorganization we assumed that the higher the to a cell designed for one person, it is not clear turnover of inmates in an institution the greater whether this is due to having to share one's cell would be the social disorganization and consewith another person, or the reduced space per perquent psychological stress. We were able to get son, or both. In addition, all of these cells had doudata on total population, admissions, incident ble decked bunks and our evidence indicates that such bunks produce some negative effects. It is reports, and administrative remedies at one institution. The rates of incident reports and adpossible that double cells with single decked ministrative remedies were used as indicants of bunks and/or as much space per person as single cells may not yield strongly negative reactions. stress. Incident reports are initiated by the staff especially if choice of roomates is allowed.

(and usually involve some infraction of the rules). Administrative remedies are responses to inmate complaints. Periods of higher turnover were accompanied by higher rates of both incident reports and administrative remedies.

Not surprisingly, open dorms represent the least desirable housing quarters. However, the effects of dormitories can be greatly attenuated under certain conditions. We have found that single bunking, spaciousness, and segmenting the dormitories We have also re-examined some data reported earlier to see how it fits with our notion of the role into small bays are all associated with reductions of social disorganization. We found that when inin the negative reactions typically associated with dividuals are assigned to new sleeping quarters, open dormitories. Dividing open dorms into small either from outside or within the institution, illcubicles is particularly effective in reducing some ness complaint rates reach very high levels for of the negative effects of open dorms. In the case of about the first 6 weeks then decline substantially. two prisons in which fairly elaborate cubicles were This is true even though the individuals have been used, almost all of the negative effects, with the exception of higher illness complaint rates, in the institution for a period of time and the associated with dormitory crowding disappeared. assignment is from less desirable to more

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SOME PERTINENT DATA ON CROWDING

Our data also indicate that substantial variation in total institutional population can have dramatic effects on health related behavior. The larger an institution is in terms of total population the higher the death, suicide, and psychiatric commitment rates. Increases in population without parallel increases in facilities had the same type of effects.

Thus far, the optimum amount of space required in inmates living quarters has been difficult to determine. We found that increasing square footage from 50 to 60 square feet improved inmates' reactions at one institution, but a similar variation from 54 to 66 square feet had no appreciable effect at another. While making single cells more spacious than 50 square feet seems desirable and may improve inmate reactions, we have found no evidence to indicate that a 50 square foot cell is psychologically inadequate. Since we have not examined single cells smaller than that, we do not know whether 50 square feet represents the minimally adequate size for a single room. Certainly, simply from the standpoint of being able to move around in one's cell, smaller units do not seen feasible. Whether extremely large single cells can produce additional benefits remains to be seen. It appears that once one reaches space per person levels of 50 square feet or higher, the number of people one is living with and how one's space is arranged (single bunking, cubicling, segmenting into bays) may be the main factors determining reactions to one's housing.

If we had to suggest a design for an ideal prison solely from the perspective of reducing crowding effects, independent of other prison management considerations, it would be relatively small (certainly less than 1,000 and preferably 500) and consist of single rooms or cubicles.

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T HE PRISON is periodically rediscovered in the United States. It is rediscovered with some regularity when prisoners rebel against their captivity.

BENJAMIN FRANK, PH.D.

