Experiencing Homelessness in California

John J. Voyer, Ph.D.
Professor Emeritus of Business Administration
School of Business
University of Southern Maine

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Abstract

Thirty percent of the nation's people experiencing homelessness live in California. A comprehensive study, "Toward a New Understanding: The California Statewide Study of People Experiencing Homelessness," examined this issue. The present paper applied systems thinking and system dynamics to this study's findings. Several simulations using a system dynamics model found policies to consider. Willingness to move into a shelter is a surprisingly high-leverage strategy, so authorities should encourage it. Rental assistance can be very powerful at preventing homelessness in the first place. Increases in housing costs lead to increases in people experiencing homelessness, and vice versa. Prevention of substance abuse and assistance at speeding up recovery are potent policies. The primary balancing loops for returning people experiencing homelessness to the general population are services for mental health, substance abuse, employment, and housing. Making life harder for people experiencing homelessness is not a high leverage approach; the meager benefits do not outweigh the humanitarian problems.

In 2022 there were 421,392 people experiencing homelessness in the United States, with 127,768 of those experiencing chronic homelessness (National Alliance to End Homelessness, 2023). The state of California seems particularly hard hit by this phenomenon. It has approximately twelve percent of the population of the United States, but, with more than 171,000 people experiencing homelessness (Kushel and Moore, et al. 2023), thirty percent of the nation's people experiencing homelessness live in California.

This situation motivated the Benioff Homelessness and Housing Initiative at the University of California San Francisco to do a comprehensive study of the issue in California. The result was "Toward a New Understanding: The California Statewide Study of People Experiencing Homelessness" (Kushel and Moore, et al. 2023). The study's authors used the acronym CASPEH to discuss the California Statewide Study of People Experiencing Homelessness; I will often refer to it that way. Between October, 2021 and November, 2022, the Benioff Center used a combination of 3,200 surveys and 365 in-person interviews in eight counties representing eight distinct regions of the state (Kushel and Moore, et al. 2023: 12), all aimed at gaining a better understanding of the issue in California.

I have a modest goal for the present paper:

> To understand the problem of people experiencing homelessness by applying systems thinking and system dynamics to the findings of the exhaustive Kushel and Moore (2023) CASPEH study of experiencing homelessness in California.

This has proven to be a more difficult undertaking than originally envisioned. The Kushel and Moore (2023) study does an excellent job of scrutinizing and dissecting the voluminous data produced by the methods its investigators used. However, dynamics, which of course are what are of interest in the present paper, make up a relatively small part of it. Fortunately, Chapter 2 of Kushel and Moore (2023), "Pathways to Homelessness," does provide some material related to dynamics, which I shall cover after first reviewing useful background elements contained in the CASPEH study.

Becoming Homeless: A Dynamic Hypothesis

The Central Causal Loop of Homelessness

The title of chapter 2 of "Toward a New Understanding: The California Statewide Study of People Experiencing Homelessness" (Kushel and Moore, 2023) is "Pathways to Homelessness," and it contains most of the study's discussion of the dynamics of homelessness. Here is the closest the authors get to describing dynamics:
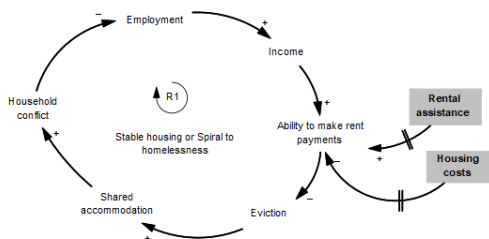
> For example, job loss may lead participants to fall behind in rent, which may lead the household to be evicted. After eviction, household members may move in with family members without a lease. Overcrowded conditions can cause tempers to flare, leading to conflict.

Presumably, this conflict-filled situation leads the family in question to leave their host household, which makes employment difficult, ultimately leading to experiencing homelessness. Figure 1 shows this situation in a causal loop diagram, as a reinforcing loop, R1.
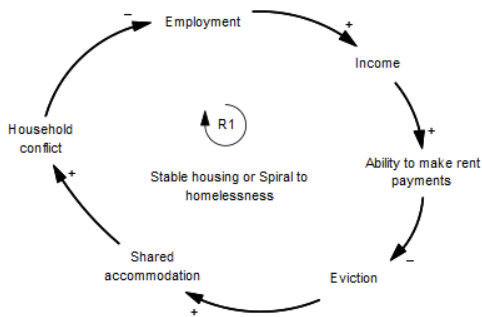
Figure 1. Causal loop diagram of the central dynamics of homelessness.

Figure 2. Creating housing stability by reducing housing costs or providing rental assistance.

It is noteworthy that this is a reinforcing loop. Even though there are more than 400,000 people in the United States who are experiencing homelessness at any given time, they only make up approximately 0.13 percent of the total population. Well over ninety-nine percent of the population stays on the "stable" side of this dynamic situation, i.e., they have income sufficient to pay for housing—thereby avoiding eviction, shared accommodation, and household conflict—making for stable employment and continued sufficient income.

On the other hand, those residents who lose sufficient income end up in the "Spiral to homelessness." They are unable to pay for housing, get evicted, and must share accommodation, which in turn causes household conflict. This conflict may lead directly to homelessness, or may lead there indirectly through the inability to hold steady employment and income.

In gray boxes, Figure 2 shows two exogenous policies that could create or restore stability to this central dynamic: Rental assistance and Reduced housing costs (Kushel and Moore, 2023: 46-48, 74). Presumably, agencies working with people experiencing homelessness could quickly implement a policy of rental assistance; however, the so-called "Section 8" federal voucher program, along with similar programs in various states, already exist, and they have at least two issues: vouchers can be difficult and time consuming to obtain, and the government does not require landlords to accept them (Kushel and Moore, 2023: 75-77). This is why the arrow from Rental assistance to Ability to make rent payments in Figure 2 has a delay marker. Housing costs are also a policy with delays; although it is possible for reduced demand to lead rents to decrease in a somewhat short period, typically rents respond to increased housing supply, which can take time to build (Kushel and Moore, 2023: 83-84).

Reinforcing Loops Exacerbating Homelessness
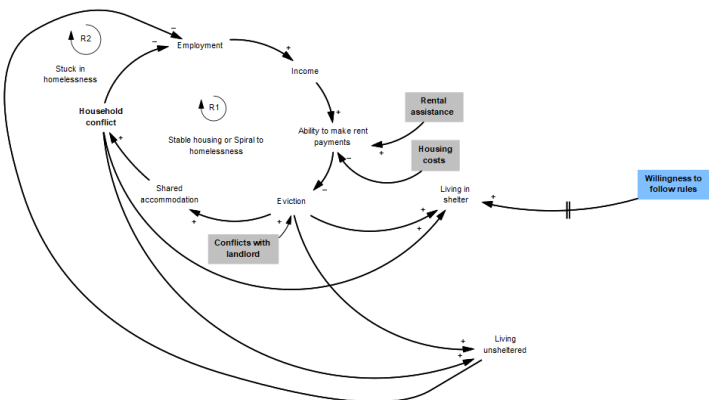
Figure 3. Willingness to follow rules affects how people experience homelessness after eviction or voluntary leaving.

Figure 3 shows what can happen if conflict with landlords (shown as a gray box) leads the latter to evict people from their housing, or if people choose to leave the household conflict that often results from shared accommodation. Whether such people end up in a shelter or choose to live in unsheltered encampments, or in their vehicles, depends on their willingness to follow the rules (which

Figure 3 shows as a blue box) typically enforced by shelters (Kushel and Moore, 2023: 53).

Those who choose to live unsheltered typically have difficulty securing stable employment (Kushel and Moore, 2023: 66-68), which creates another reinforcing loop, R2, which I have labeled Stuck in homelessness in Figure 3. Reduced income reduces the Ability to make rent payments, which increases the likelihood of Eviction, which leads to Living unsheltered (if the people choose the "freedom" of encampments over the rules of the shelter). Living unsheltered leads to reduced employment opportunities, which reduces income, restarting the downward spiral of the reinforcing loop.
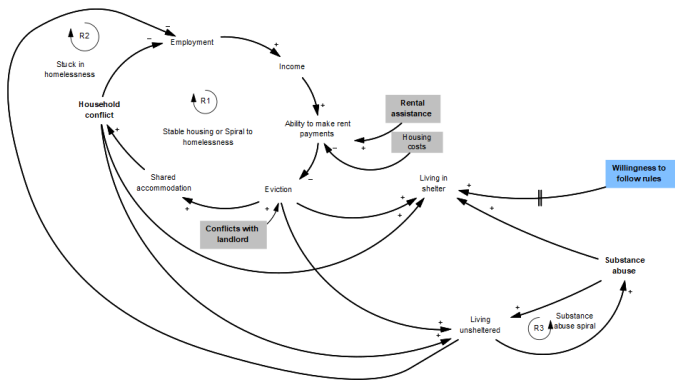

Figure 4. The substance abuse spiral.

I identified one final reinforcing loop, R3, labeled the Substance abuse spiral in Figure 4. Kushel and Moore (2023: 61) found that thirty-five percent of people experiencing unsheltered homelessness engage in substance abuse three or more times per week. Since shelters usually do not allow substance use, users generally continue to live in encampments or other unsheltered modes, such as their vehicles.

Balancing Loops in the Homelessness System

Figure 5 shows four balancing loops that can help people experiencing homelessness gain Employment and Income and begin to turn their lives around. Note that all four loops require being in a shelter.
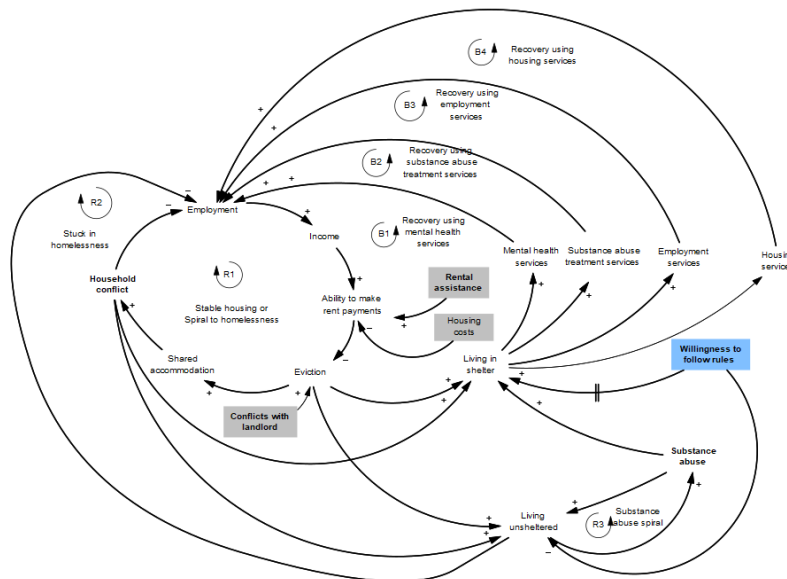
In California, Kushel and Moore (2023) found that mental illness was common among members of their sample:

Current mental health symptoms were common.

Figure 5. The balancing loops using shelter-based services to potentially reduce homelessness.

Two-thirds (66%) of participants reported experiencing symptoms of either depression, anxiety, trouble concentrating or remembering, or hallucinations in the past 30 days. Many experienced more than one type of symptom. Half (51%) experienced anxiety, half (48%) experienced depression, one-third (37%) reported trouble concentrating or remembering, and 12% reported hallucinations (Kushel and Moore, 2023: 59).

Loop B1, labeled Recovery using mental health services, uses the mental health services typically offered by shelters (Kushel and Moore, 2023: 63) to help people experiencing homelessness who are mentally ill to become well enough to gain employment.

As cited earlier, many people experiencing homelessness suffer from substance abuse. Many, perhaps most, shelters offer substance abuse treatment, which leads to Loop B2, Recovery using substance abuse treatment services. People experiencing homelessness who can learn to control their substance abuse have a higher chance of gaining Employment and Income and thereby becoming housed (Kushel and Moore, 2023: 85).

The CASPEH study found that, across all age and family groups, only eight percent of people experiencing homelessness were employed for at least twenty hours per week, although eighteen percent reported earning some income from work (Kushel and Moore, 2023: 67). Seventy-six percent received pension or Social Security payments for income, and some could not work because of disabilities. Many shelters offer Employment services (Kushel and Moore, 2023: 87), which improve chances for people experiencing homelessness to gain employment, shown in Loop B3, Recovery using employment services.
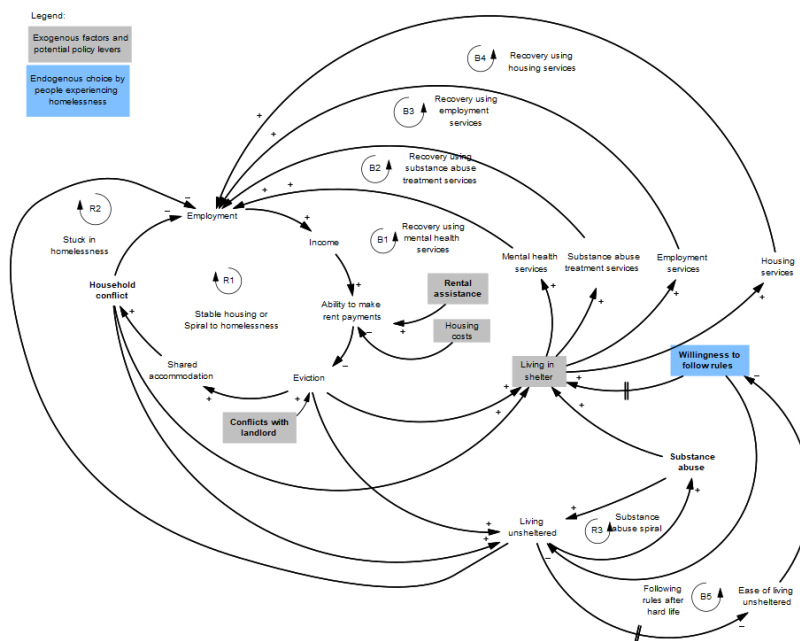
Figure 6. Accepting shelters after unsheltered life becomes too difficult. This is also the full dynamic hypothesis.

Lastly, most shelters or their affiliated non-profit organizations offer services to find appropriate housing for their clients. Many of Kushel and Moore's respondents found "services offered in shelters to be ineffective for securing permanent housing" (2023: 53), but there no doubt were successes at finding housing for shelter clients, as shown in Loop B4 in Figure 5.

Some people who experience homeless are initially reluctant to move into a shelter:

> … Some living in encampments held negative views of congregate shelters. They reported concerns about COVID and other health risks of sleeping in close quarters. They noted burdensome rules about securing a bed, curfews, and the need to vacate during the day as disincentives to shelter stays. (Kushel and Moore, 2023: 53)

However, after some time in their unsheltered setting, particularly in colder climates, many people experiencing homelessness find that life is too hard (see the delay marking in Figure 6 on the negative link from Living unsheltered to Ease of living unsheltered). They reluctantly decide they are willing to follow shelter rules and, after another delay, they choose to move into a shelter. This forms the final

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balancing loop, shown in Figure 6, Loop B5, Following rules after hard life. If people in the shelter successfully use the shelter's services, they may be on their way to housing. The four balancing loops may reintroduce them to the stable side of Loop R1, the Stable housing reinforcing loop.

Having added all the loops discussed above, Figure 6 therefore shows the full dynamic hypothesis derived from the CASPEH study (Kushel and Moore, 2023).

Who Experiences Homelessness in California

The CASPEH study broke down the demographics of its respondents along several dimensions:

- Family structure
- age
- marital or partner status
- race
- domicile immediately prior to the current episode of homelessness
- gender
- sexuality
- education
- veteran status
- prior experience of homelessness
- length of current episode
- how chronic was a respondent's homelessness

This many characteristics obviously could lead to atomization of respondents into many small groups. Accordingly, in the present paper I rely mostly on family structure, since the CASPEH study used official federal definitions.

Family Structure

Here are the three federally-defined family structures into which people experiencing homelessness fall:

- **Single homeless adults** (adults 25 and older who are not living with minor children). These people were ninety percent of the CASPEH sample.
- **Adults in homeless families** (adults living with minor children). This constituted seven percent of the sample.
- **Transition age young adults** (TAY; young adults aged 18-24 not living with minor children). These people were three percent of CASPEH's respondents. (All percentages from Kushel and Moore, 2023: 20.)

Housing Situations Prior to Experiencing Homelessness

Four percent of respondents to the CASPEH study entered homelessness from a house financed by a mortgage. The vast majority fell into three types of housing situations prior to experiencing homelessness:

- **Non-leaseholder housing situation**, e.g., living with family or friends. This constituted forty-nine percent of the CASPEH respondents.

- **Leaseholder arrangement**, which made up twenty-eight percent of those who were experiencing homelessness in the CASPEH study.
- **Institutional setting**, such as prison or extended jail time. Nineteen percent of those queried by the CASPEH study team fell into this category.

Disaggregation of Types of People Experiencing Homelessness

Figure 7. Disaggregation, by family structure and nature of prior housing situation, of People Experiencing Homelessness
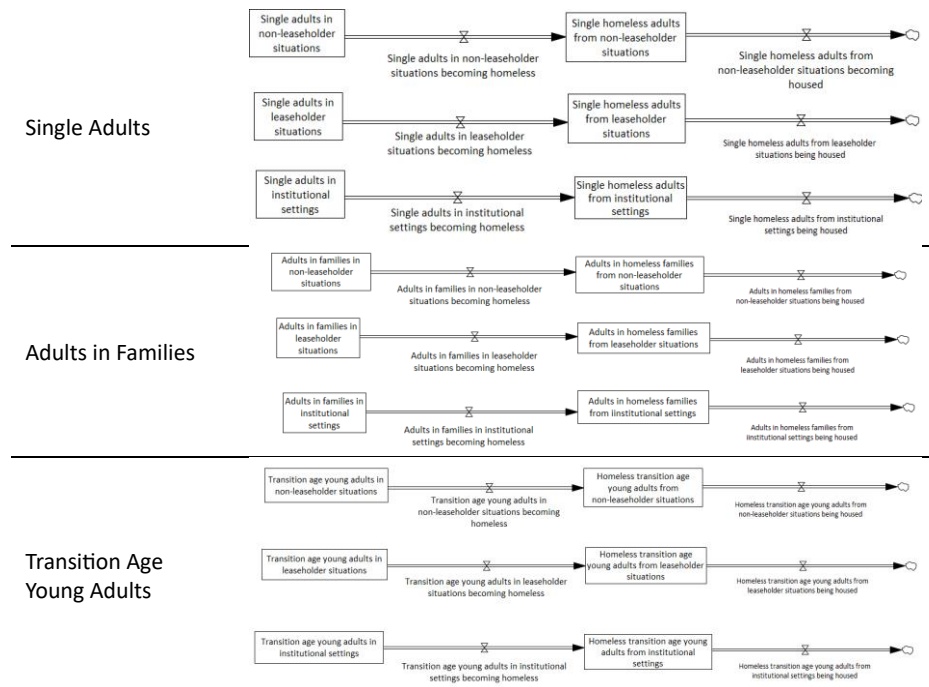
Family structure and prior housing situation are just two of many demographic categories in the CASPEH study, yet just these two categories lead to the complicated disaggregation of stocks shown in Figure 7.

This cluttered approach to demographic dis-aggregation unne-cessarily complicates any effort to model homelessness in California. Accordingly, I will use family structure as the focus of disaggregating and modeling the CASPEH data.
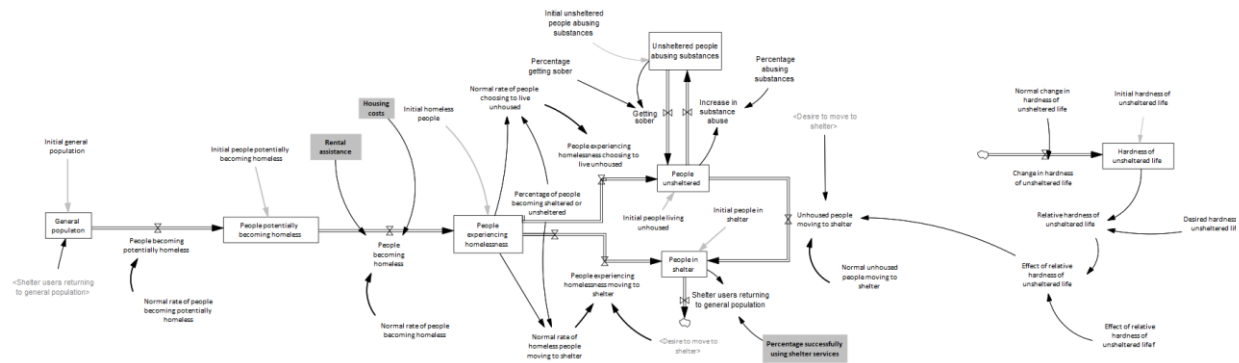
A Model of People Experiencing Homelessness in California

Figure 8, on the next page, shows a system dynamics model formulated to test the dynamic hypothesis. *Please note that this is stylized model, designed to gain some understanding of the system, as opposed to mapping the actual numbers in California.* It is based on the information obtained from the 3,200 respondents to the CASPEH study. Please note that all the stocks have first-order controls—which prevent the stocks from going negative—that I omitted from the figure to reduce clutter.

Figure 8's Panel A, the Family Structure View, flows from left to right, starting at the General population, which in California is approximately forty million people. *The model uses subscripts based on family structure*, so the breakdown of the Initial general population in the model roughly corresponds to the proportion of the three family structures in that study: 36 million Adults with families, 2.75 million Single Adults, and 1.25 million Transition Age Young Adults.

The 3,200 respondents to the CASPEH study fell into three groups quite different from the general population, since single adults make up a far greater proportion of people experiencing homelessness: 220 Adults with families, 2,880 Single Adults, and 100 Transition Age Young Adults, which is representative of the number of people experiencing homelessness. For the flow Normal rate of people

Panel A. Family Structure View
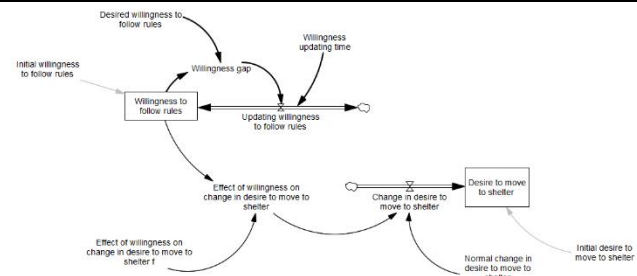
Panel B. Willingness View

Figure 8. Stock-and-flow system dynamics model of people experiencing homelessness in California

becoming potentially homeless, which moves people from the General population to the stock People potentially becoming homeless, I chose to use ten percent of the group percentages, specifically, 22 Adults with families per year, 288 Single Adults per year, and 10 Transition Age Young Adults per year. I used the same numbers for the flow People becoming homeless. These are assumptions that I believe are plausible and sufficient for a stylized model like this one.

Panel A of Figure 8 shows, in gray boxes, the two exogenous factors that affect People becoming homeless: Housing costs and Rental assistance. The CASPEH study noted that increases in Rental assistance (Kushel and Moore, 2023: 75-76) and reductions in Housing costs (Kushel and Moore, 2023: 32, 74) both were measures that could prevent the experience of homelessness in the first place. Hence, in the model they contribute to controlling the flow from the stock People potentially becoming homeless to the stock People experiencing homelessness.

Once people experience homelessness, there are two outflows, each controlled by two factors:

- the Percentage of people becoming either sheltered or unsheltered, which is set initially at 50 percent—half move directly into a shelter, while the other half move into unsheltered situations, such as their vehicles or encampments, and
- the Desire to move to shelter, which Panel B of Figure 8 shows, and which I will discuss later.

Panel A shows how People in shelter and People unsheltered move differently through the system. People unsheltered live a hard life, formulated in the model as a stock whose level gradually rises over time. This level is the input to a rising non-linear function that drives Unsheltered people moving to shelter. That is, as unsheltered life gets harder, Unsheltered people decide to flow out of their vehicles or encampments and move into a shelter.

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About thirty percent of People unsheltered suffer from substance abuse, which creates a flow from the stock of People unsheltered to the stock Unsheltered people abusing substances. Some percentage of the Unsheltered people abusing substances either get sober on their own, or get sober through the encouragement of others. This creates a flow back to their being simply People unsheltered, some of whom may later flow into the People in shelter stock.

Whether they initially go to the shelter, or go only after life gets too hard, the People in shelter may avail themselves of the various services—mental health, substance abuse, employment, and housing—offered there. At least some of those people who consume the services may then flow back to the General population. Figure 8 shows this percentage as a gray box, Percentage successfully using shelter services, which controls the outflow Shelter users returning to general population.

As mentioned earlier, a key element for potentially reducing the number of people experiencing homelessness is their willingness to follow the rules typical of a shelter, where they can consume its services and move out of that experience. Panel B of Figure 8 shows the structure of this important element.

It starts with a straightforward first-order smooth of the stock Willingness to follow rules, which starts at zero but moves over time to the modest goal of 60 percent willingness. The model I will explain later uses an adjustment time of five years, but government officials may adjust that period down by law-enforcement "nudging" or by better "sales effort" from shelter operators, or both.
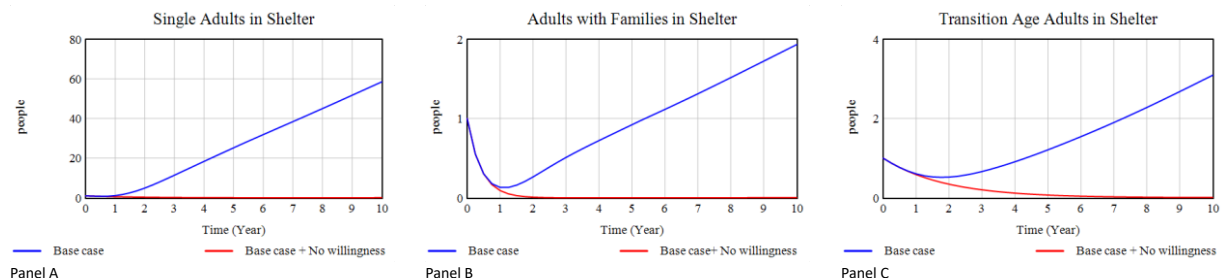
Willingness to follow rules drives a rising non-linear function that affects the Desire to move to shelter. That is, as Willingness rises, the Desire to move to shelter gradually rises, which affects two flows from Panel A: People experiencing homelessness choosing to live unsheltered and People experiencing homelessness moving to shelter.

Policy (and Other) Experiments

Base Case vs. Low Willingness

In the base case of this situation, experiencing homelessness creates a hard life, at least some people are willing to follow rules and go directly to a shelter, and some people are not initially willing to follow rules and become unsheltered. Of that latter group, some people engage in substance abuse.

As mentioned in the discussion of the dynamic hypothesis, Willingness to follow rules is of pivotal importance in solving the experience of homelessness. Figure 9 shows the results of a simulation run comparing the base case and a case where Willingness to follow rules is nonexistent, even though the

Panel A   Panel B   Panel C

Figure 9. **Comparison of Base Case and Case with Low Willingness to Follow Rules**

experience of homelessness is still hard. The three panels show the results for people in Shelter: Panel A for Single Adults, Panel B for Adults with Families, and Panel C for Transition Age Adults.

For all three family structures of people experiencing homelessness, people in the shelter drop to zero in the case where Willingness to follow rules is low (red curves in Figure 9), while the base case shows a result where more people end up in the shelter (blue curves in Figure 9) because of their willingness to follow rules.
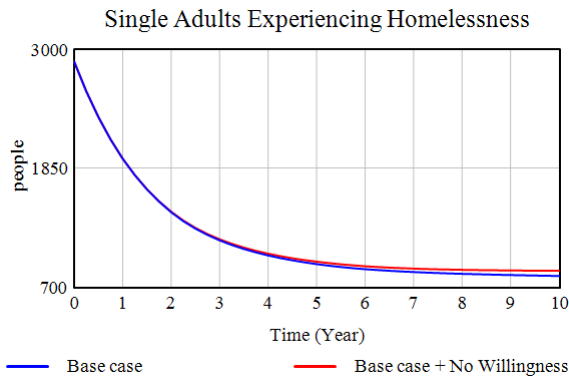
Figure 10. Single Adults Experiencing Homelessness, Willingness vs. Lower Willingness

Note that the shapes of the curves are similar for each of the three family structures. Since Single adults make up by far the largest number of people experiencing homelessness, and for the sake of clarity, I will use only that group in the remaining figures, unless a policy experiment requires otherwise.

As Figure 10 shows for Single adults experiencing homelessness, even with low willingness among *some*, the numbers go down because others are willing, and because the hard life ultimately persuades unsheltered people to move to a shelter.
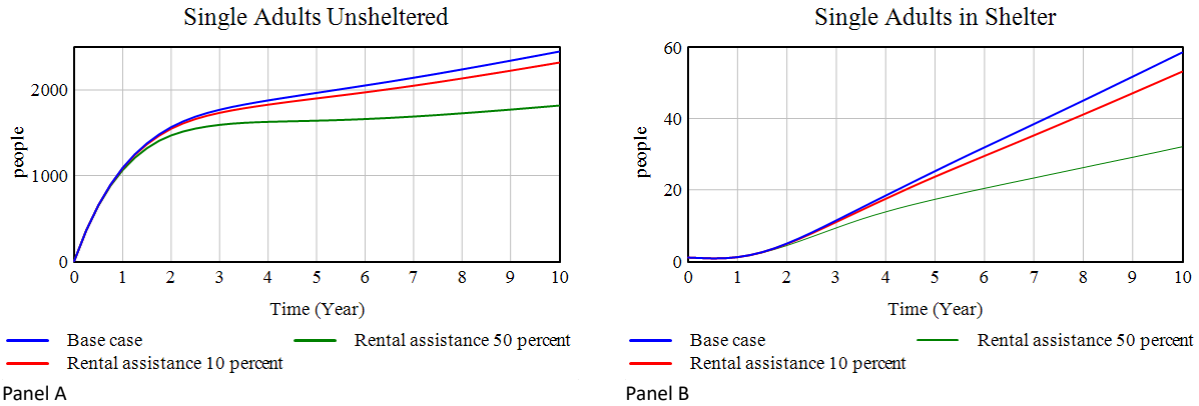
Rental Assistance

As Kushel and Moore (2023: 75-76) mention, rental assistance, usually in the form of vouchers, might help to prevent the experience of homeless in the first place, and would help to end it. The problem is that vouchers might take a long time to get, and many people who obtain one have a hard time finding landlords willing to accept them. However, vouchers could cover all rental expenses above 30 percent of a renter's income (Kushel and Moore, 2023: 75-76).

Figure 11 compares the base case (blue curve) to the effects of two scenarios—a 10 percent voucher (red curve) and a 50 percent voucher (green curve)—on the number of Single adults experiencing homelessness. Not surprisingly, by short-circuiting the flow from potential homelessness to actual homelessness, both policies are effective, with the higher voucher, not surprisingly, being more effective.
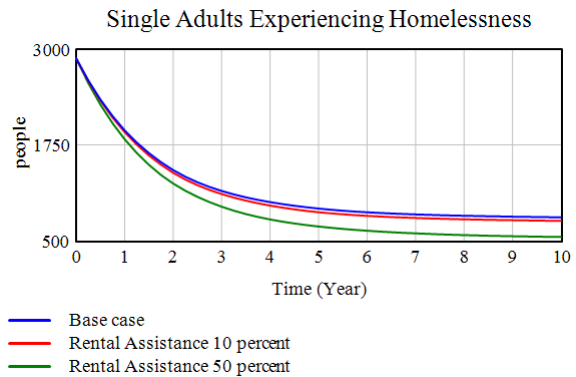

Figure 11. The Effects of Rental Assistance on Single Adults Experiencing Homelessness.

Figure 12. Effects of Rental Assistance on Unsheltered and Sheltered Single Adults

Downstream, Figure 12 shows how housing assistance reduces the number of Single adults unsheltered (Panel A) and Single adults in shelter (Panel B). For both types of groups, ten percent rental assistance (red curve) is better than the base case (blue curve), and fifty percent rental assistance (green curve) is even better.

Clearly, providing rental assistance is a good policy, but it is contingent on having enough housing, being able to obtain vouchers, and having landlords accept them.
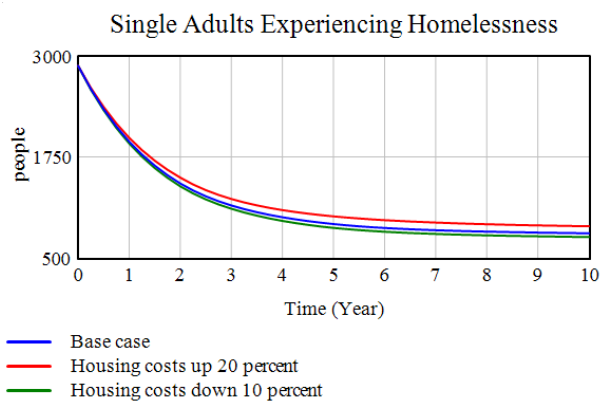
Figure 13. The Effects of Rising and Falling Housing Costs on Single Adults Experiencing Homelessness.
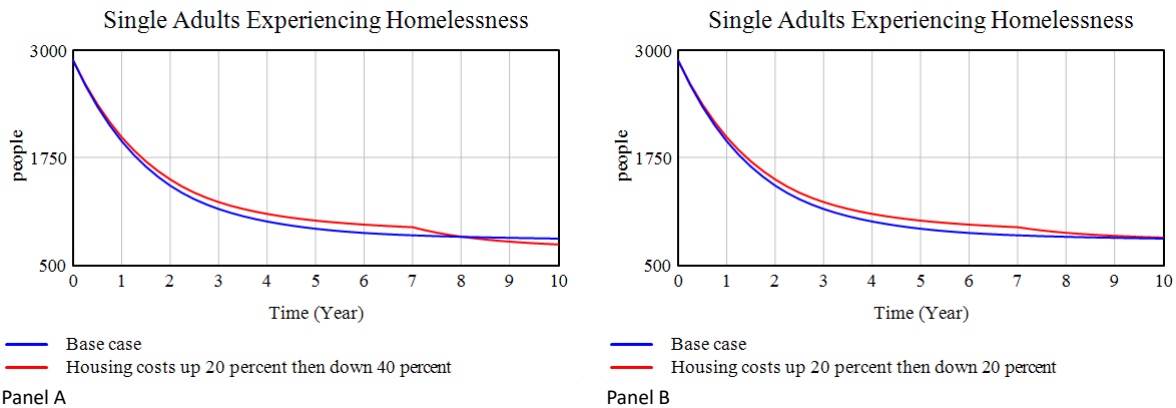
Housing Costs

As Kushel and Moore point out, rising housing costs account for a very large percentage of people who move from housed to unhoused (2023: 83-84). Figure 13 shows the effects of two scenarios on Single adults experiencing homelessness: a 20 percent increase in housing costs (red curve in Figure 13) and a 10 percent decrease in housing costs (green curve in Figure 13). Of these, the 20 percent increase is the likelier, and it causes Single adults experiencing homeless to rise noticeably above the base case.
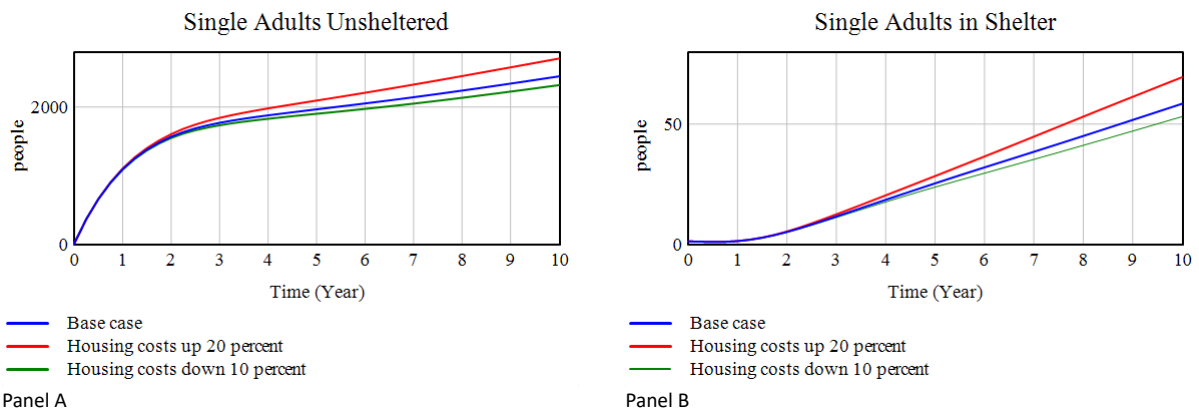
Figure 14. Effects of Rising and Falling Housing Costs on Unsheltered and Sheltered Single Adults

As with rental assistance, rising and falling housing costs have downstream effects. Figure 14 (on the previous page) shows these effects on unsheltered Single adults (Panel A) and Single adults in shelter (Panel B). The likelier outcome—rising housing costs—raises the number of sheltered and unsheltered people (red curves in Panels A and B).

What if housing costs were to rise for seven years, and then, because of increased housing supply or reduced demand, they dropped? I ran a scenario where costs rise by twenty percent from years zero to six, and then drop to twenty percent below the base case starting in year seven. Figure 15 shows the results of such a simulation as a red curve. The number of Single adults experiencing homelessness drops more slowly than in the base case (blue curve), but then, after Housing costs drop, that number drops below the base case (red curve in Figure 15, Panel A). For a twenty percent drop—essentially a return to the initial price level—the number of Single adults experiencing homelessness (red curve in Figure 15, Panel B) is above the base case (blue curve), but the two trajectories come together by the end of the ten-year simulation period.


Panel A

Panel B

Figure 15. Effects of 20 Percent Rise of Housing Costs Followed by 40 Percent Drop (Panel A) or 20 Percent Drop (Panel B).

Working to Reduce Substance Abuse

Following Kushel and Moore (2023: 61), in the base case I assume a 30 percent rate of substance abuse among Single adults and Transition Age Young Adults experiencing homelessness, but of 5 percent among Adults with families (based on the assumption that parents experiencing homelessness are motivated to stay away from substance abuse). Similarly, I assume rates of "getting sober" of 25 percent for Single adults and Transition Age Young Adults experiencing homelessness, but of 90 percent for Adults with families. Figure 16 shows the results from the base case.
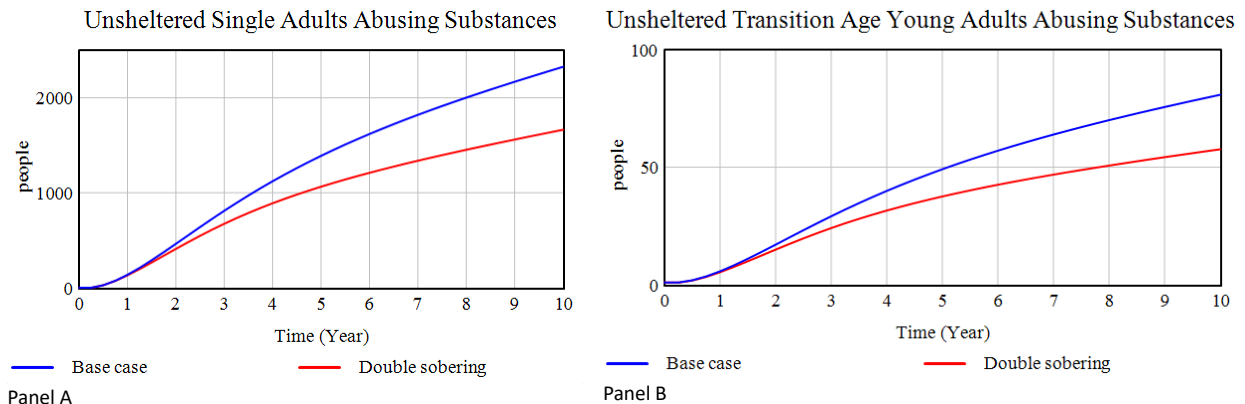

Panel A

Panel B

Panel C
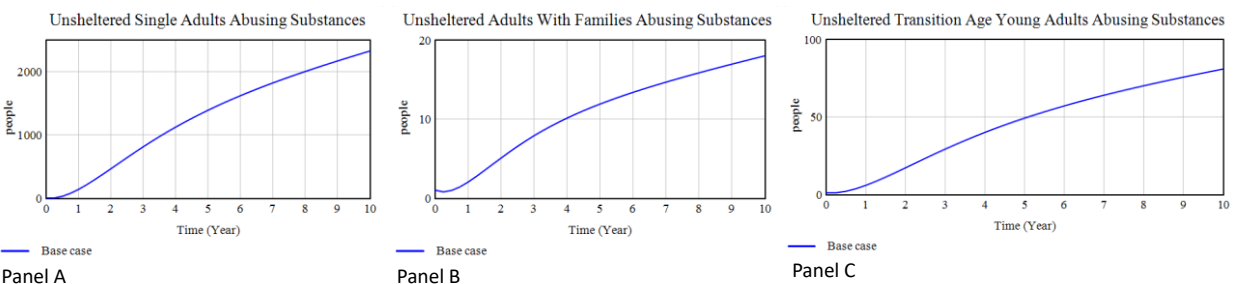
Figure 16. People Abusing Substances, Base Case
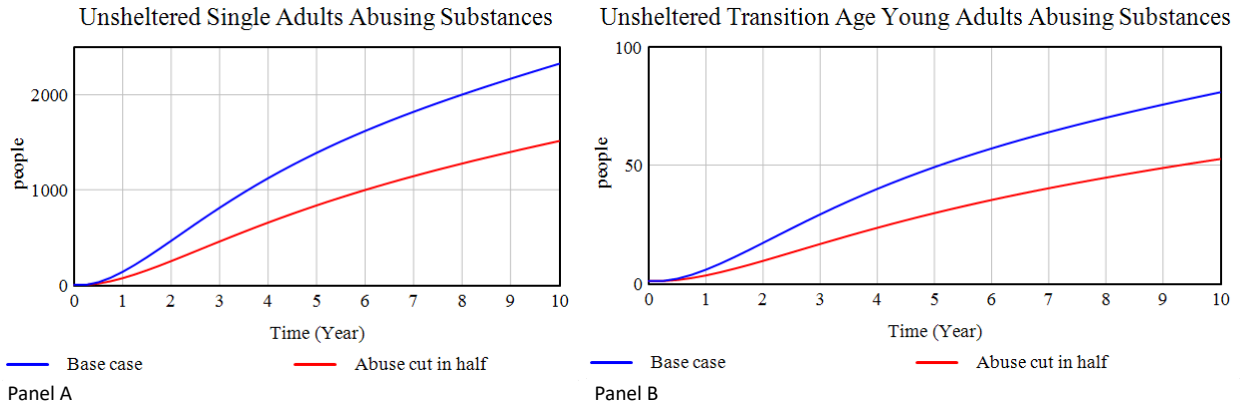
Figure 17. Effects of Cutting Substance Abuse in Half

As one potential policy, authorities charged with helping people experiencing homelessness could try to work with Single adults and Transition Age Young Adults to reduce their substance abuse from 30 percent to 15 percent. Figure 17 shows what could happen: cutting substance abuse in half shows significant drops in substance abuse among unsheltered Single Adults (red curves in Panel A) and unsheltered Transition Age Young Adults (red curves in Panel B).

I also tested a policy where helping authorities could improve the rate at which unsheltered Single adults and Transition Age Young Adults got sober after beginning substance abuse. Figure 18 shows the results of doubling this percentage from 25 percent to 50 percent.

Figure 18. Effects of Doubling Percentage Getting Sober

Again, there are significant improvements among Single adults (red curve in Panel A) and Transition Age Young Adults (Panel B).

Lastly regarding substance abuse, I tested a policy cutting the percentage abusing substances in half and the percentage getting sober doubled. Figure 19 on the next page shows the results—a significant drop in substance abuse among both Single adults and Transition Age Young Adults.
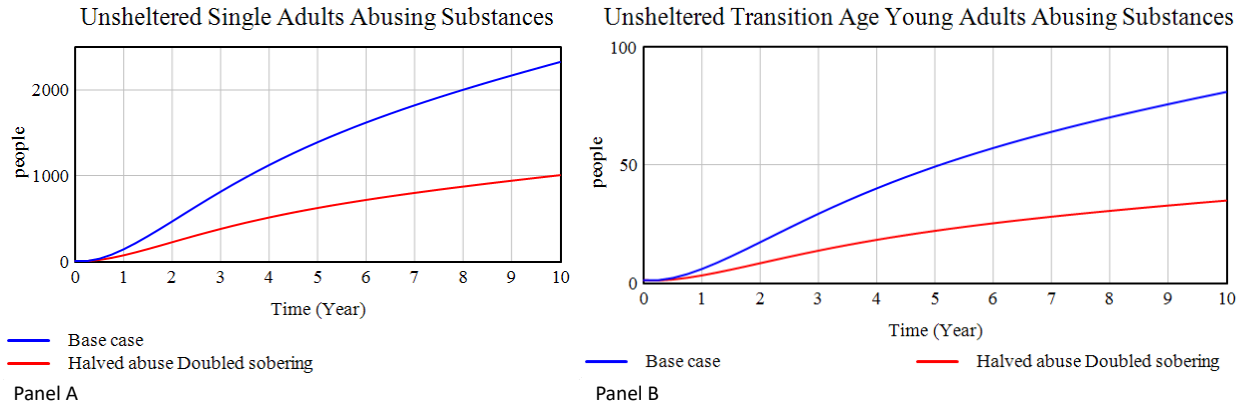
Figure 19. Effects of Cutting Substance Abuse in Half While Also Doubling Percentage Getting Sober.

Use of Shelter Services

As mentioned earlier, an important role of shelters, beyond their central role of literally providing *shelter* to people experiencing homelessness, is to provide services—substance abuse treatment, mental health treatment, employment assistance, and housing assistance—designed to get them back into stable housing. In the base case, I set the percentages of successful services use across the three family structures as follows: 90 percent for Adults with Families, 25 percent for Single Adults, and 25 percent for Transition Age Young Adults, based on the assumption that Adults with Families might be more motivated to use the services and get themselves and their children back into the general population.

As a test of a pessimistic outcome, I will now discuss a scenario where all three groups use *zero* percent of the available services. Figure 20 shows the results. For all three family structures, more people remain in the shelter (red curve) than in the base case (blue curve). This is because, by not using the shelter's services, people experiencing homelessness have "trapped" themselves in the shelter; by choosing not
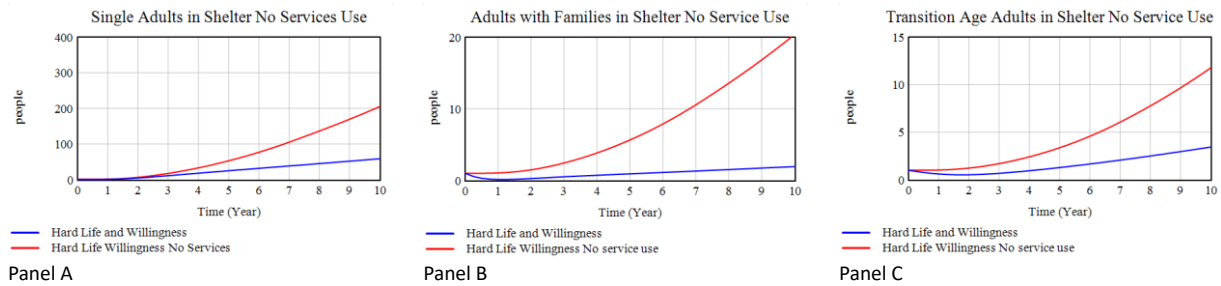
Figure 20. Comparison of Base Case and Case with Zero Use of Shelter Services.

to use the services, they cannot leave the experience of homelessness and get back—in better mental health, housed, sober, and employed—to the stable side of reinforcing Loop R1 from Figure 1.

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Even if Single Adults and Transition Age Adults do not use the shelter's services, persuading Adults with Families (who may be more motivated because they have children with them) to use the services with 45 percent effectiveness would make a difference. Figure 21 shows the difference between using zero percent of services (red curve) versus their having 45 percent effectiveness of services (blue curve). Significantly fewer Adults with Families stay in the shelter if they use the available services even somewhat successfully.
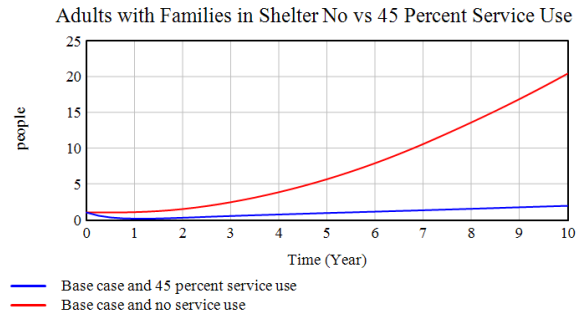
Figure 21. Effect of Persuading Adults with Families to Have 45 Percent Usage of Shelter Services.

Encouraging Willingness

As Kushel and Moore pointed out (2023: 53), people experiencing homelessness are often unwilling to go to a shelter, despite its services and their long-term benefits. So another avenue for helping them might be to encourage them to be more willing. Sometimes this could take the form of "selling" the idea more effectively; other times, it could be gently coercive, as when authorities tell people in encampments that they have a choice between incarceration or the shelter and its services. A shelter might look more attractive than a jail cell under those circumstances.
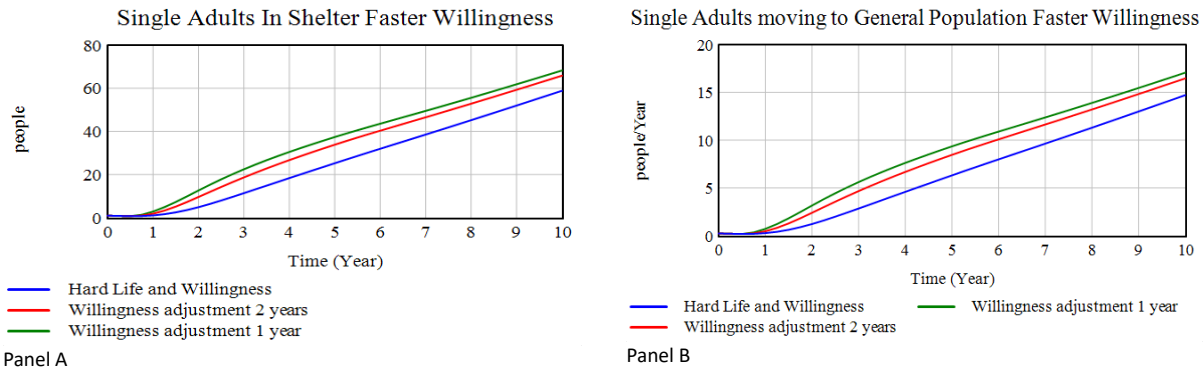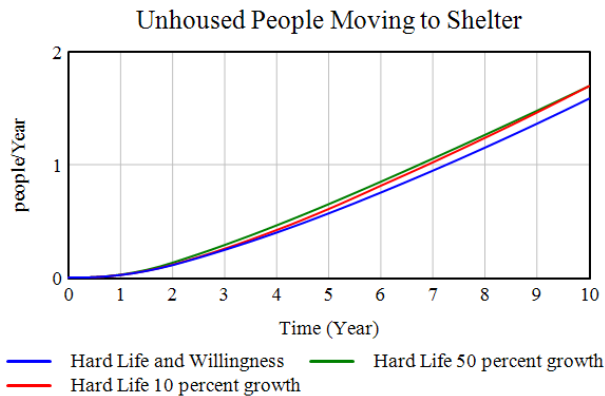

Panel A

Panel B

Figure 22. Effects of Encouraging Greater Willingness to Enter Shelter.

Figure 22 shows the beneficial effects of faster acceptance of willingness to enter a shelter. Panel A shows that a 2-year adjustment time for willingness leads to more Single Adults entering the shelter (red curve) compared to the base case (blue curve). A 1-year adjustment time is even better, with somewhat more Single Adults entering the shelter (green curve). Panel B of Figure 22 shows the modest beneficial effects on Single Adults moving back to the general population of a 2-year willingness adjustment time (red curve) and of a 1-year willingness adjustment time (green curve); both are better at moving Single Adults out of the shelter and back to the general population than the base case is (blue curve).

Making Life Harder

I tested a scenario where, whether by a policy of deliberate harassment or because of naturally-occurring harsher weather, life could become harder for Unhoused people. Figure 23 on the next page shows the result. Not only is making life harder questionable from a humanitarian perspective, it appears in any case to be a low-leverage policy when compared to the base case (blue curve in Figure 23).

Unhoused People Moving to Shelter

people/Year

Time (Year)

— Hard Life and Willingness   — Hard Life 50 percent growth
— Hard Life 10 percent growth

Figure 23. **Effects of a Harder Life**

Whether life becomes more difficult at a 10 percent rate (red curve) or a robust 50 percent rate (green curve), its effects seem weak. Perhaps this is why, even in very cold winter climates, the federally-mandated "point in time" count of people experiencing homelessness (U.S. Department of Housing and Urban Development, 2023), which occurs in every year in January, always finds unsheltered people, people who apparently do not care how hard, or cold, life becomes.

Limitations and Strengths of, and Future Work on, the Model

The largest shortcoming of the model presented here is that it is a *stylized* model, as opposed to its trying to map historical data about people experiencing homelessness in California. However, I hope that it nevertheless provides insight into the system that explains how people end up experiencing homelessness, and some ideas about how to address the problem. The model's potential insight is probably its greatest strength.

The model does not explicitly include affordable housing and its availability to the low-income people that typically make up the population of people experiencing homelessness (Kushel and Moore, 2023: 53). Clearly, the people moving back to the general population need somewhere to go before they can leave the shelter. However, the model glosses over that, as it implicitly assumes that someone has built or otherwise supplied affordable housing.

The model also does not directly include the "housing first" concept:

> Housing First is a homeless assistance approach that prioritizes providing permanent housing to people experiencing homelessness, thus ending their homelessness and serving as a platform from which they can pursue personal goals and improve their quality of life. This approach is guided by the belief that people need basic necessities like food and a place to live before attending to anything less critical, such as getting a job, budgeting properly, or attending to substance use issues. (National Alliance to End Homelessness, 2022)

However, if we compare the idea of providing permanent housing to the model's concept of the shelter, the outcomes are likely similar. That is, services provided in a shelter, if effective, are likely to have similar effects as those provided to people in a housing first regimen.

Explicitly including the supply, and its effects, of affordable housing and explicit treatment of the "housing first" concept clearly are avenues for future work to elaborate and improve the model presented in this paper.

Conclusions

Despite its flaws, the model achieves its modest goal of understanding the problem of people experiencing homelessness by applying systems thinking and system dynamics to the findings of the

exhaustive Kushel and Moore (2023) CASPEH study ("California Statewide Study of People Experiencing Homelessness").

Several policy implications emerge from the model's simulation runs:

1. Willingness to move into a shelter is a surprisingly high-leverage strategy. It is worth trying to encourage people experiencing homelessness to be willing to go to a shelter, as opposed to living in their vehicles or an encampment. Authorities can accomplish this with persuasion and "salesmanship" (see Figure 9) or by gentle prodding from law enforcement (see Figure 18). Even a small increase in willingness can provide some benefit (see Figure 10).
2. Rental assistance can be very powerful at preventing homelessness in the first place (see Figure 11). Rental assistance prevents people from living unsheltered (Figure 12, Panel A) and results in fewer people needing the shelter (Figure 12, Panel B). Obviously, higher assistance (green curves in Figure 12) is more effective than lower assistance (red curves in Figure 12).
3. Housing costs are difficult to control, but their effects are profound. Increases lead to increases in people experiencing homelessness (Figures 13 and 14), while decreases lead to decreases in people experiencing homelessness (Figures 13 and 14). Perhaps through increased construction and supply, increases in housing costs can later decrease, reversing some of this negative effect (Figure 15).
4. Substance abuse is a stubbornly persistent problem among people experiencing homelessness. Policy tests showed a significant reduction in the number of people abusing substances from preventing unsheltered Single adults and Transition Age Young Adults from engaging in substance abuse to begin with (Figure 17). Increasing the recovery rate had similar beneficial effects (Figure 18), but combining better prevention and higher rates of recovery had dramatically beneficial effects for both groups (Figure 19).
5. As discussed in the section on the dynamic hypothesis, the primary balancing loops for getting people experiencing homelessness back into the general population are services for mental health, substance abuse, employment, and housing. These are typically available in shelters, but those participating in a "housing first" approach also receive them. Figure 20 shows that all three family structures—Adults with Families, Single Adults, and Transition Age Young Adults— get better results, even compared to the base case, from successful use of those services. Figure 21 shows that even a modest success level from use of the services produces a beneficial result.
6. Making life harder for people experiencing homelessness is not a high leverage approach, as shown in Figure 22. The meager benefits do not outweigh the humanitarian problems.

The present paper, by showing the systemic nature of the problem of people experiencing homelessness, provides some useful policies for solving, or at least reducing, it. The model does not put a monetary value on the problem-solving activities, and provision of shelters and their attendant services is expensive. However, an initiative by the San Diego (California) United Way, "Project 25," using a modified housing first approach, reduced average per-person costs of homelessness from over $111,000 to $12,000, according to its web page (Father Joe's Villages, 2015). However, that organization spent $1.5 million to get those results for 33 people, or an average of almost $45,000 per person. Clearly, this was money well spent to get those 33 people back into the general, self-sufficient population, but the point is that the policies recommended in the present paper, no matter how worthy, are expensive.

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