Job Loss and Unmet Health Care Needs in the Economic Recession: Different Associations by Family Income

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Objectives. We examined heterogeneous associations between job loss and unmet health care needs by family income level in the recent economic recession.

Methods. We conducted logistic regression analyses with the sample from the 2008 Survey of Income and Program Participation (n = 12 658). Dependent variables were 2 dichotomous measures of unmet health care needs in medical and dental services. The primary independent variables were a dummy indicator of job loss during a 2-year period and the family income-to-needs ratio. We used an interaction term between job loss and the family income-to-needs ratio to test the proposed research question.

Results. Job loss was significantly associated with the increased risk of unmet health care needs. The proportion with unmet needs was highest for the lowest-income unemployed, but the association between job loss and health hardship was stronger for the middle- and higher-income unemployed.

Conclusions. The unemployed experience health hardship differently by income level. A comprehensive coordination of applications for unemployment and health insurance should be considered to protect the unemployed from health hardship. (*Am J Public Health.* 2014;104:e178–e183. doi:10.2105/AJPH.2014.301998)

The number of unemployed as a result of the 2007 economic recession was virtually unprecedented in the United States.[1] The unemployment rate increased from 5% in December 2007 to 10% in October 2009 and remained above 9% throughout 2010. An estimated 14 million residents were out of work as of July 2011.[1] Job loss leads to negative shocks to family income and the loss of employer-sponsored health care benefits and increases families' risk of unmet health care needs.[2] Findings from the 2010 Commonwealth Fund Biennial Health Survey demonstrated that about 60% of the unemployed (9 million of 15 million) became uninsured between 2008 and 2010,[2] exposing their families to the risk of negative health consequences.

The public health costs of job loss have been examined extensively in the literature, and the association between unemployment and poor physical and mental health is well established.[3–5] A substantial body of research has indicated strong associations of unemployment with self-rated poor health and somatic illness.[4,6–8] There is also considerable evidence that unemployment is associated with a decline in psychological well-being and the development of mental health problems such as depression, anxiety, substance abuse, antisocial behavior, and unhealthy behaviors.[9,10] Studies have demonstrated a significantly higher hazard of suicide mortality for the unemployed than for the employed after adjusting for potential confounders such as preexisting physical health problems.[11] Although individuals sometimes do lose their jobs owing to their poor health, research has shown that the negative health effects of unemployment are not solely because of this.[8]

The negative effects of unemployment on health have been explained with a variety of theories.[8,12,13] For example, the agency restriction model[14] suggests that the main consequence of unemployment is the loss of income, which results in deterioration in well-being, whereas the financial distress and shame model indicates that the shame associated with job loss accounts for the adverse effects of unemployment.[15] Beyond income loss, one of the mechanisms linking unemployment and ill health is the lack of access to affordable and adequate health care.[12,16] It is difficult for the unemployed to afford continued health care coverage. A recent study found that in the United States, only 48% of unemployed individuals had health care insurance compared with about 80% of those employed.[16] The unemployed are also at risk for higher medical expenditures (e.g., out-of-pocket expenses), which adds additional financial pressures to their families.

Health services use patterns may have been significantly altered for the unemployed who lost jobs with health care benefits during the recession. For example, even among adults with private health insurance, 15% of those unemployed experienced either a delay or a lack of needed medical care because of cost compared with 9% of those employed, and 9% of the unemployed went without needed prescriptions compared with 5% of those employed.[16]

Although unemployed individuals and their families face the challenge of accessing health services, the association of diminished health and no health services with unemployment may differ among various populations.[12,17,18] One of the suggestions to improve the research on health and unemployment[17] is to better understand such heterogeneous impacts of unemployment. For example, it has been suggested that the physical and psychological effects of unemployment probably are greatest in middle age[19] and may disproportionately affect women.[20] Catalano et al.[21] also found that high unemployment predicted reduced detection of local breast tumors differently between African American and non-Hispanic White women.

Different reasons may explain the heterogeneous associations of unemployment with health services. Unemployment rates vary by demographic and socioeconomic characteristics. In addition, the negative effects of job loss may be mitigated if the unemployed have sufficient buffering resources (e.g., savings), easy access to public health insurance, and strong social capital (e.g., informal social networks and social support).[22,23]

To our knowledge, however, little is known about the heterogeneous associations of unemployment with health services during the recent economic recession. We have begun to fill this gap by focusing specifically on the association between job loss and unmet health care needs by level of family income. Although the association of unemployment with health service use may vary by the level of family income, it is not clear whether lower- or higher-income families suffer more from unemployment. Lower-income families could suffer more from unemployment than do higher-income families because the latter are more likely to have emergency savings, accumulated assets, and access to other resources to buffer income loss and financial strain generated from unemployment.[14,23–25] The lower-income unemployed generally have a higher uninsured rate than do the higher-income unemployed.[2]

It is also possible that the higher-income unemployed have a stronger perception of unmet health care needs than do those with lower income, because the higher-income unemployed and their families are more likely to receive the employer-sponsored health care benefits through the job that was lost in the economic recession.[2,12,20] Because health service use is positively associated with family income, higher-income families, as suggested by the cybernetic model,[12] generally have a higher standard or reference goal for "needed health services" and thus have a greater challenge to adapt to a new level of health service consumption after unemployment than do the lower-income unemployed.

Gunderson and Gruber[26] distinguished 2 economic stressors—long-term poverty and short-term income shocks—as different determinants of material hardship for low-income and high-income families. From this perspective, unemployment, as a trigger event of negative income shocks, may be more closely associated with unmet health care needs of the higher-income unemployed. In addition to income shocks, the loss of latent benefits from employment, such as time structure, social contact, and socioeconomic status,[12,15,27] possibly results in harder impacts on the higher-income unemployed. Furthermore, the lower-income unemployed are more likely to access public health insurance and other safety net programs than do those with a higher income.

METHODS

To examine different associations between job loss and unmet health care needs by level of family income, we used data from the Survey of Income and Program Participation (SIPP), a longitudinal survey operated by the US Census Bureau on a nationally representative sample.[28] The SIPP interviews respondents in multiple waves with a time interval of 4 months to collect information on demographics, economic resources, employment, and public assistance program participation. Each SIPP panel has a sample size of 14 000 to 36 700 families and ranges from 2.5 to 4.0 years. We used the first 6 waves of the 2008 panel and had an observation period from September 2008 to August 2010, which is a time range roughly consistent with the 2007 economic recession.

Because our focus is the association between the change of employment status and unmet health care needs, we limited the sample to primary families headed by a working-age (i.e., aged 16–60 years) individual who was employed in the reference period of wave 1. In addition, we excluded families that did not complete all 6 waves of interviews or lived in group quarters; the final analytic sample included 12 658 primary families.

Measures

We measured family unmet health care needs with 2 survey questions included in wave 6. These 2 questions asked whether, in the previous 12 months, family members "needed to see a doctor or go to the hospital but did not go" (1 = yes, 0 = no) and "needed to see a dentist but did not go" (1 = yes, 0 = no). Similar measures have been used in previous studies on unmet health care needs.[29–31]

The SIPP recorded weekly employment status of respondents in the observation period from September 2008 to August 2010 (104 or 105 weeks depending on the interview time of sample respondents), including the following 5 categories:

1. "with job, working";
2. "with job, absent without pay but not on layoff";
3. "with job, absent without pay and on layoff";
4. "no job, looking for work or on layoff"; and
5. "no job, not looking for work and not on layoff."[29]

For the indicator of job loss, we coded those reporting the third or fourth category as 1 (experiencing a job loss) and others as 0. We considered respondents reporting the fifth category as out of the labor force; they may have retired from the work, returned to school, or had chronic health conditions or disability not allowing them to work. Another dichotomous variable indicated whether respondents were in or out of the labor force.

Using the average income from 4 reference months in wave 1, we created an income-to-needs ratio variable that categorized the sample into 3 groups: families with average income below the 200% monthly poverty threshold, between the 200% and 400% monthly threshold, and above the 400% monthly threshold. Monthly poverty threshold is the 2008 federal poverty line provided by the US Census Bureau[32] divided by 12.

We included several demographical characteristics in wave 1 as control variables, such as family heads' age, gender, race (non-Hispanic White, non-Hispanic Black, Hispanic, and other), education (high school and below, some college, and 4-year college and above), marital status (married and other), and citizenship (citizen or not). We added several family characteristics into the analyses as well, including family types (couple headed, male headed, and female headed), number of family members, number of children living in the family, homeownership (homeowner and other), and metro status (metro and other). Metro status identified metropolitan statistical areas and consolidated metropolitan statistical areas as defined by the Office of Management and Budget.[33] We generated an indicator of whether sample respondents were out of the labor force during the observation period from weekly employment status and included this indicator in our analyses. We controlled for state fixed effects.

Statistical Analyses

We have reported sample characteristics in Table 1 and the bivariate associations between job loss and unmet health care needs by

TABLE 1—Weighted Descriptive Statistics of Sample Characteristics: Survey of Income and Program Participation, United States, 2008

Variable	Mean (SD) or %
Age, y	42.7 (10.4)
Male	52.8
Race/ethnicity	
Non-Hispanic White	71.4
Non-Hispanic Black	11.3
Hispanic	11.4
Other	5.9
Education	
≤ high school	24.8
Some college	37.2
≥ bachelor's degree	38.0
Married	61.3
Is a citizen	93.2
Family type	
Couple headed	60.0
Male headed	17.5
Female headed	22.4
Family size, no.	2.6 (1.4)
No. of children	1.0 (1.2)
Owns home	70.9
Metro status[a]	81.4
Had unmet needs in medical services	7.5
Had unmet needs in dental services	8.8
Experienced job loss	17.3
Average monthly income, $	6600.8 (5791.2)
Income-to-needs ratio	
< 2	20.3
2–4	31.2
> 4	48.0

Note. We created income-to-needs ratio by categorizing the sample into 3 groups: families with average income below the 200% monthly poverty threshold, between the 200% and 400% monthly threshold, and above the 400% monthly threshold (poverty threshold defined by the 2008 US Census). The sample size was n = 12 658.

[a]Metro status identified metropolitan statistical areas and consolidated metropolitan statistical areas as defined by the Office of Management and Budget.

income in Table 2. Because 2 outcome variables—unmet needs in medical and dental services—are dichotomous, we used 2 logit models to examine the associations between job loss and unmet health care needs by family income (Table 3). We regressed 2 outcome measures on the variables of job loss, income-to-needs ratio, their interaction term, and control variables. We adjusted all analyses using the longitudinal family weight variable the SIPP provided. We conducted all analyses in Stata/SE version 12.1 (StataCorp LP, College Station, TX).

RESULTS

As shown in Table 1, about half the family heads in the sample were male, and the majority of them were non-Hispanic White (71%). On average, sample respondents were aged about 43 years (SD = 10.4 years) at wave 1. Nearly 75% of family heads had at least some college experience, and more than half (56%) were married. Regarding family characteristics, two thirds were led by couples, slightly higher than the reported marital rate. The average family size was 2.6 (SD = 1.4), and the mean number of children living in the family was 1 (SD = 1.2). Of sample respondents, 71% owned their homes.

There were 7.5% of families reporting that they had unmet medical needs, and 8.8% indicating that they had unmet dental needs. About 17.0% of family heads experienced job loss from September 2008 to August 2010. The average family income across 4 months in wave 1 was $6600. Nearly half the families had an average monthly income 4 times higher than, 31% with income between 2 and 4 times, and 20% below 2 times the monthly poverty threshold.

Bivariate Associations Between Job Loss and Unmet Needs by Income

Table 2 lists the percentage of families with unmet health care needs by job loss and income and their corresponding 95% confidence intervals (CIs). The comparisons indicate that families whose heads experienced job losses had statistically significant higher rates of unmet needs in both outcome measures than did their counterparts without job loss ($P < .001$) across 3 income levels. For example, for respondents with income below 200% of the poverty line, the rate of unmet needs in medical services for those with a job loss was about 1.4 times that for those without a job loss (18.6% vs 13.3%).

As expected, proportions of those with unmet health care needs decreased along with an increase in income levels. However, the unmet needs ratio between those with and those without a job loss increased with higher levels of income. For example, the unmet needs ratio for medical services was about 2 for those with income-to-needs ratio between 2 and 4 and was nearly 3 for those with income-to-needs ratio above 4.

Results of Logit Regression

The results of multiple logit regressions presented in Table 3 were consistent with those in Table 2. Regarding unmet needs in medical services, the odds ratio (OR) between respondents with and without job losses was 1.4 (b = 0.36; 95% CI = 0.08, 0.62; $P < .01$) for those with income below the 200% poverty line. The interaction terms between job loss and income were statistically significant and positive (b = 0.39; 95% CI = 0.01, 0.76; $P < .05$ for those with an income-to-needs ratio between 2 and 4; and b = 0.71; 95% CI = 0.30, 1.11; $P < .001$ for those with an income-to-needs ratio above 4).

As suggested by previous research,[34–36] the estimated coefficient of the interaction term in nonlinear models may not provide accurate information about interactive effects. Therefore, we further calculated the average marginal effects of job loss on unmet needs in medical services. The estimated marginal effects of job loss (Figure 1) were consistent with the coefficients reported in Table 3. Controlling for demographic and socioeconomic characteristics, job loss increased the probability of reporting unmet needs in medical services by 3.8 percentage points ($P < .001$) for families with and income-to-needs ratio below 2, 6.1 percentage points ($P < .001$) for those with an income-to-needs ratio between 2 and 4, and 6.4 percentage points ($P < .001$) for those with an income-to-needs ratio above 4.

Results on unmet needs in dental services were slightly different from those on unmet needs in medical services. Although the OR between respondents with and those without job losses was 1.7 and significant for those with an income-to-needs ratio below 2 (b = 0.53; 95% CI = 0.27, 0.78; $P < .001$), the interaction term of job loss and those with an income-to-needs ratio between 2 and 4 was not statistically significant at the .05 level (b = 0.19), and the interaction term of job loss and those with an

TABLE 2—Percentage of Unmet Health Care Needs by Job Loss and Income: Survey of Income and Program Participation, United States, 2008

Income-to-Needs Ratio	Respondents Without a Job Loss, % (95% CI)	Respondents With a Job Loss, % (95% CI)	Ratio Between Respondents With and Without a Job Loss
< 2 (n = 2623)			
Unmet needs in medical services	13.3 (11.6, 14.9)	18.6 (15.4, 21.7)	1.4
Unmet needs in dental services	14.2 (12.4, 15.9)	22.2 (18.9, 25.5)	1.6
2–4 (n = 4061)			
Unmet needs in medical services	6.9 (5.9, 7.8)	13.7 (11.1, 16.4)	2.0
Unmet needs in dental services	8.9 (7.8, 9.9)	16.8 (13.9, 19.7)	1.9
> 4 (n = 5974)			
Unmet needs in medical services	3.3 (2.8, 3.8)	9.3 (7.1, 11.5)	2.8
Unmet needs in dental services	3.8 (3.3, 4.4)	9.5 (7.2, 11.7)	2.5

Note. CI = confidence interval. We created income-to-needs ratio by categorizing the sample into 3 groups: families with average income below the 200% monthly poverty threshold, between the 200% and 400% monthly threshold, and above the 400% monthly threshold (poverty threshold defined by the 2008 US Census). The sample size was n = 12 658.

income-to-needs ratio above 4 was significant at the .05 level (b = 0.41; 95% CI = 0.01, 0.80; $P < .05$). The estimated average marginal effects of job loss, however, were not consistent with parameter estimates. On average, the job loss increased the probability of reporting unmet needs in dental services to the strongest extent for those with an income-to-needs ratio between 2 and 4 (7.4 percentage points; $P < .001$), followed by those with an income-to-needs ratio below 2 (6.9 percentage points; $P < .001$) and those with an income-to-needs ratio above 4 (5.7 percentage points; $P < .001$).

DISCUSSION

Consistent with previous literature on unemployment and health services,[2,37] job loss was statistically associated with the increased risk of unmet health care needs. Findings further suggest that job loss may have a greater influence on health care needs for those with a higher income. We found that the association between unemployment and unmet needs in medical services was stronger among the higher-income unemployed whether we evaluated as a parameter estimate or average marginal effects. The estimated marginal effects of job loss suggested that the association of unemployment with unmet needs in dental services was strongest among the middle-income families.

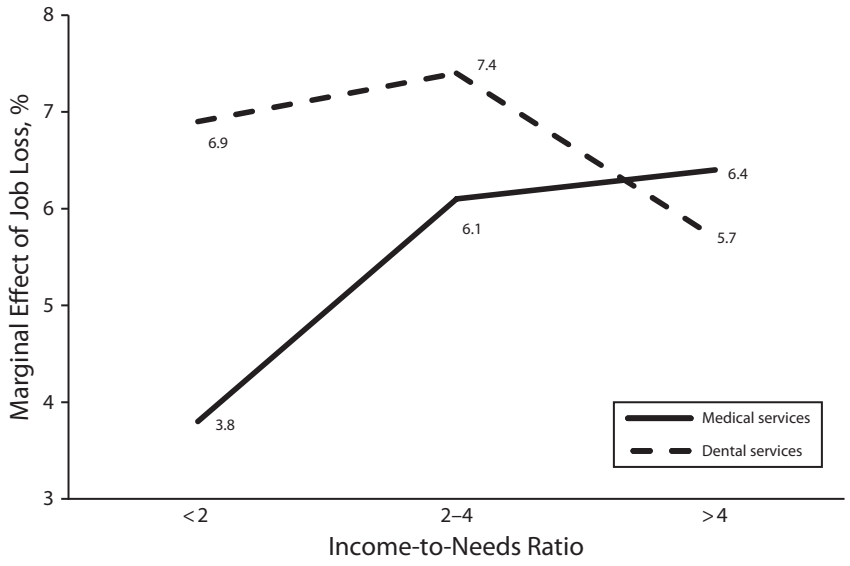
Overall, the association of unemployment with dental services was not strongest for those with an income-to-needs ratio below 2. Unemployment had a greater association with health service use among the middle- and the high-income unemployed, even though the low-income unemployed had the highest level of unmet needs. These results may not be surprising because, in the recent economic recession, the probability of losing health care benefits because of job loss for middle- and high-income families was about 2 times that for low-income families.[2]

A stronger association between job loss and health service use among the higher-income unemployed can be explained by different theories. First, the cybernetic model,[12] which focuses on the discrepancy between an

TABLE 3—Weighted Results of Logit Regression for Job Loss and Unmet Health Care Needs by Income: Survey of Income and Program Participation, United States, 2008

Variable	Medical Services		Dental Services	
	b (95% CI)	OR (95% CI)	b (95% CI)	OR (95% CI)
Job loss				
No (Ref)	1.00	1.00	1.00	1.00
Yes	0.36** (0.08, 0.62)	1.42 (1.09, 1.85)	0.53*** (0.27, 0.78)	1.69 (1.32, 2.17)
Income-to-needs ratio				
< 2 (Ref)	1.00	1.00	1.00	1.00
2–4	−0.59*** (−0.81, −0.38)	0.55 (0.45, 0.68)	−0.47*** (−0.65, −0.30)	0.62 (0.51, 0.76)
> 4	−1.16*** (−1.41, −0.90)	0.31 (0.24, 0.41)	−1.25*** (−1.50, −1.00)	0.29 (0.22, 0.37)
Job loss × income-to-needs ratio				
Job loss × < 2 (Ref)	1.00	1.00	1.00	1.00
Job loss × 2–4	0.39* (0.01, 0.76)	1.48 (1.01, 2.15)	0.19 (−0.05, 0.58)	1.21 (0.86, 1.72)
Job loss × > 4	0.71*** (0.30, 1.11)	2.03 (1.35, 3.03)	0.41* (0.01, 0.80)	1.50 (1.01, 2.23)
F-adjusted mean residual test	$F(9,12\,649) = 0.81$; $P = .61$		$F(9,12\,600) = 0.63$; $P = .77$	

Note. CI = confidence interval; OR = odds ratio. We created income-to-needs ratio by categorizing the sample into 3 groups: families with average income below the 200% monthly poverty threshold, between the 200% and 400% monthly threshold, and above the 400% monthly threshold (poverty threshold defined by the 2008 US Census). We controlled for demographic characteristics. Results on control variables are not reported in the table and can be requested from the lead author. The sample size was n = 12 658.
*$P < .05$; **$P < .01$; ***$P < .001$.



Note. We created an income-to-needs ratio by categorizing the sample into 3 groups: families with average income < 200% monthly poverty threshold, 200%–400% monthly threshold, and > 400% monthly threshold (poverty threshold defined by the 2008 US Census).

FIGURE 1—Average marginal effect of job loss on unmet health care needs by income: Survey of Income and Program Participation, 2008.

individual's perceived and desired state, suggests that income adaptation after negative income shocks generated by job loss may be more difficult for the higher-income unemployed because of their previous consumption level. Lower-income people may use health care less on a routine basis, perceive fewer health care needs than do higher-income families, and perceive weaker impacts of job loss on their health services usage.[37]

According to the Andersen model of health services use,[38] before job loss, higher-income families may perceive stronger needs for health services and respond to these needs more immediately than do their lower-income counterparts. The experiences of unemployment may have a greater impact on higher-income families' ability to respond to their health care needs. Thus, health hardship and unmet health care needs are more likely to be tightly linked for the higher-income families when they do not have access to buffering resources (e.g., emergency savings).

Second, the self-reported measures of unmet health care needs may also reflect the anxiety or psychological well-being of the unemployed. This is consistent with the prediction of the financial distress and shame model,[12] which posits that the loss of well-being is partially because of the psychological effects of or adverse psychological reaction to unemployment. Previous studies have consistently demonstrated that job loss is associated with the concerns of loss of socioeconomic status and declined mental health; this mechanism may also have a greater influence on the higher-income unemployed.[3]

Limitations

This study has several limitations. First, we measured job loss simply by whether the change of job status from being employed to unemployed was ever experienced during the observation period. Unemployment experience may be more complex than is the variable we used. For example, we did not measure the duration of employment. We counted job loss reported by family heads only, not other family members; however, employment-based health care benefits may be linked to other family members' employment status. Future research should identify measures that include the complexity of job loss.

Second, we focused on the association between unemployment and health hardship by family income level. Thus, we did not examine a complicated dynamic process, for example, by examining potential mediating or moderating pathways by health insurance and underinsurance, savings, public program participation, or informal support. We did not link the experiences of unemployment with the loss of employment-based health care benefits. Future studies should examine how unemployment leads to unmet health care needs by taking into account the potential roles of these predictors.

Conclusions

Our findings have implications for public policy related to health insurance. Clearly, unemployment is associated with health care utilization and unmet health care needs for the unemployed. The finding of different associations by family income suggests that targeted outreach may be needed during periods of economic downturn to guide subgroups to health access and avoid delayed health care for the unemployed. Using these findings, targeted outreach may also include higher-income groups that become unemployed to provide information and guidance toward both affordable and appropriate insurance and health services.

Under the Affordable Care Act, employed and unemployed individuals are now required to have health insurance. Lower-cost options are available through the online health care marketplaces. Applicants can compare available coverage and be advised whether they are eligible for subsidized or free health care coverage.[39] Additionally, new rights, consumer protections, and benefits could result in lower out-of-pocket costs for insured consumers. To further assist the unemployed through streamlining application processes, benefit applications, including unemployment and health insurance applications, could be coordinated.[40]

Linking applications could minimize the number of steps needed to apply so that a family applying for unemployment benefits would automatically be screened for health insurance coverage as well as for eligibility for other public benefits. This coordination could facilitate the receipt of myriad benefits, products, and services for all unemployed individuals and their families and could be a particular benefit for middle- and high-income households that have less familiarity with state services. Such coordination could prevent unmet health care needs through the provision of

low-cost health insurance with affordable out-of-pocket costs. Additionally, comprehensive coordination of applications for unemployment, health insurance, and other social programs could reduce psychological barriers for accessing needed health services.

Because a mix of federal and state governments administers these programs, the federal government could facilitate and support such coordination and offer enhanced data systems.[41] Alternatively, states could begin to experiment with such linkage, as Massachusetts is through its Medical Security Program whereby unemployed residents automatically receive an application for the health insurance that is linked to unemployment benefits when they file a claim.[42] ■

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Contributors

J. Huang conceptualized the study question and approach, carried out the data analyses, and wrote the initial draft of the article. J. Birkenmaier contributed to forming research questions and conceptual models. Youngmi Kim contributed to the analysis plan. All authors contributed to writing and revising the article and approved the final draft as submitted.

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Human Participant Protection

Institutional review board approval was not needed because we used only secondary data to conduct this study.

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