Physical and/or Cognitive Impairment, Out-of-Pocket Spending, and Medicaid Entry among Older Adults

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ABSTRACT While Medicare provides health insurance coverage for those over 65 years of age, many still are underinsured, experiencing substantial out-of-pocket costs for covered and non-covered services as a proportion of their income. Using the Health and Retirement Study (HRS), this study found that being underinsured is a significant predictor of entering into Medicaid coverage over a 16-year period. The rate of entering Medicaid was almost twice as high for those who were underinsured and with physical and/or cognitive impairment than those who were not, while supplemental health insurance reduced the rate of entering Medicaid by 30 %. Providing more comprehensive coverage through the traditional Medicare program, including a ceiling on out-of-pocket expenditures or targeted support for those with physical or cognitive impairment, could postpone becoming covered by Medicaid and yield savings in Medicaid.

KEYWORDS Medicaid, Health care costs, Disability, Cognitive impairment, Medicare

INTRODUCTION

Medicaid is the nation's health insurance safety net. It covers nearly 70 million low-income individuals—one in six Americans—and accounts for one fifth of national health expenditures.¹ It is the major source of health insurance coverage for low-income families. Less understood is Medicaid's role in covering those who have serious physical or cognitive limitations as well as chronic conditions. Individuals with physical and/or cognitive impairment (PCI) are defined as those with limitations in at least two activities of daily living (ADLs) or with mild cognitive impairment or a diagnosis of dementia or Alzheimer's disease, who are most likely to benefit from an integration of care that addresses both their medical care and their long-term services and supports needs.

Approximately 15 % of Medicare beneficiaries have functional impairment and multiple chronic conditions, and yet, they account for almost a third of all Medicare spending.² Having serious physical impairment or cognitive impairment along with three or more chronic conditions accounts for almost double the annual Medicare spending per person, than those with only three or more chronic conditions (\$15,833 versus \$7926).² While Medicare does not cover long-term services and supports costs, the high level of Medicare spending among those with functional

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limitations as well as three or more chronic conditions points to the need to provide better financial protection for such high-risk Medicare beneficiaries, facilitate the integration of medical care and long-term services and supports (LTSS) services that permits substitution of lower cost LTSS for higher cost specialized care, and test innovative models of care that reduce use of inpatient and ED care by providing better services at home.

From the Medicaid side, almost one fourth of Medicaid beneficiaries are elderly or disabled. Of the 16 million low-income older and disabled Medicaid enrollees, 10 million are also covered by Medicare. Medicaid serves as supplemental insurance to Medicare, picking up deductibles and co-insurance for those with incomes below poverty and paying Medicare Part B premiums for those with incomes up to 135 % of the federal poverty level.³ State Medicaid programs also cover long-stay nursing facility care and often cover optional health care services, such as dental care, vision and hearing services, and home and community-based services and supports not covered by Medicare. Since such expenses can be prohibitively expensive for Medicare beneficiaries with severe functional limitations requiring personal care assistance or supervision, even middle-class Americans have come to rely on Medicaid to help pay for long-term services and supports. Likewise, those who exhaust assets and become impoverished by a change in life circumstances (e.g. death of a spouse) or by high out-of-pocket medical care costs may become eligible for Medicaid. While Medicaid offers an important safety net, Medicaid policy is designed to exclude those who have the means to pay for long-term services and supports using personal assets or income.^{4,5} Despite its important role in financing long-term services and supports and in affording low-income individuals financial protection from high out-of-pocket costs, little is known about the trajectory by which individuals enter into coverage for Medicaid or how this trajectory varies by income, out-of-pocket health care expenses, or type of physical or cognitive functional limitation.

This study reports on findings for Medicare beneficiaries from the 1998–2014 Health and Retirement Study, a longitudinal survey of older Americans with interviews conducted every 2 years. The survey contains in-depth data on physical and cognitive limitations, out-of-pocket health care expenses, and coverage under Medicare and Medicaid. We focus on Medicare beneficiaries age 65 and over not covered by Medicaid at the beginning of the period and follow them over 16 years to assess whether they enter into Medicaid. We examine the association between having high out-of-pocket expenses relative to income, physical and cognitive functional impairment, and sociodemographic factors and entry into Medicaid.

We then discuss policies to improve Medicare benefits for home and community-based services that could delay or eliminate reliance on Medicaid long-term services and supports.

STUDY DATA AND METHODS

Data

The Health and Retirement Study is a nationally representative, longitudinal dataset of Americans aged 50 years and older. The Health and Retirement Study (HRS) is restricted to those who are living in the community at the time of their first interview but continues to interview participants if they become institutionalized. This analysis employs the longitudinal version of the dataset created by the RAND Corporation,

which includes comprehensive and consistent imputations for missing data.⁶ Eight interview waves at 2-year intervals are used from 1998 to 2014. Individuals were excluded from the study sample if they were covered by Medicaid at baseline (since the focus of this study is on trajectory into Medicaid), younger than 65 years of age in 1998, or not a Medicare beneficiary in 1998. Approximately 8 % of the total HRS sample over the age of 65 were covered by Medicaid in 1998 and were excluded from the study. The resulting baseline sample in 1998 consists of 9298 individuals, who, with sampling weights, represent 28.6 million Medicare beneficiaries ages 65 or older who were not on Medicaid in 1998. These study participants were followed every 2 years until they became covered by Medicaid and were censored from the study either by loss to follow-up, death, or completed participation by responding to 2014 HRS survey.

Variables/Measures

Covered by Medicaid This study examines the trajectories of Medicare beneficiaries ages 65 and older into Medicaid. In the HRS and for the purposes of this study, being covered by Medicaid is determined by self-report. Being covered by Medicaid includes those who were covered by Medicaid health insurance at any time (since the previous interview/in the last 2 years) and those who are currently covered by Medicaid at the time of the interview.⁶

Physical and/or Cognitive Impairment Functional physical impairment is defined as reporting difficulty with at least two activities of daily living (ADLs). ADLs are self-care activities necessary for living independently and include bathing, dressing, eating, transferring in and out of bed, toileting, and walking across the room.⁷ The HRS conducts a series of cognitive tests that provide mental status summary scores and word recall summary scores. Together, these scores determine an individual's total cognition score. Cognitive impairment is defined as having a total cognition score lower than 11 out of 27, as defined by Langa and Weir, where a score of 6 or less is considered dementia and between 7 and 11 as mild cognitive impairment.^{8,9} Additionally, if an individual reports ever being told by a doctor that they have a memory-related problem, such as dementia or Alzheimer's disease, they are also defined as being cognitively impaired.⁶ In the cases where individuals have a cognitive impairment that restricts them from answering the survey, proxies are used to complete the survey where possible using the IQCODE scale.¹⁰ The definition of cognitive impairment for those who have proxy respondents also follows the Langa and Weir definition, which classifies individuals into normal cognition, mild cognitive impairment, and dementia groups.^{8,9}

For the purposes of this analysis, physical and/or cognitive impairment was assessed for the entire follow-up period. If an individual had a serious functional physical and/or cognitive impairment at any time over the 16-year period, prior to entering into Medicaid, they are counted as having a physical and/or cognitive impairment.

We first examine having physical and/or cognitive impairment as a binary state that is either present or absent over the course of the entire duration of the follow-up period. We then develop a composite measure that better differentiates components of physical and/or cognitive impairment, using mutually exclusive categories as follows: no physical and/or cognitive impairment, serious functional physical impairment only (two or more ADLs), or cognitive impairment regardless of serious

functional impairment. Our measure of physical and/or cognitive impairment was computed for study participants prior to entry into Medicaid or being censored from the study.

High Out-of-Pocket Spending The definition of having high out-of-pocket spending used in this analysis is having annual out-of-pocket (OOP) medical expenditures that exceed 10 % or more of annual household income.^{11,12} High out-of-pocket spending was calculated at each interview wave over the follow-up period based on the federal poverty level (FPL) for the interview year. The sum of total OOP health care expenditures per study participant in the HRS is reported for the 2 years prior to the interview. This total value was then halved to reflect average annual OOP spending and top coded at the 95th percentile for each interview wave. OOP health care expenditures reflect the following services: hospital, nursing home, doctor, outpatient, dental, prescription drugs, and home health care/special facilities. Ever having high out-of-pocket spending is dichotomized to represent those who never have high out-of-pocket spending as a proportion of their income prior to entering into Medicaid and those who had high out-of-pocket spending in at least one interview wave prior to entering into Medicaid. This paper will henceforth refer to high out-of-pocket spending as a proportion of income as simply high out-of-pocket spending.

Insurance Coverage Both supplemental health insurance coverage and long-term care insurance coverage is reported in the Health and Retirement Study in 1998. Supplemental Health Insurance is defined as a categorical variable: Medicare only, employer-sponsored insurance (provided by the individual's employer or spouse's employer or former employer), and Medigap insurance. Differentiation of those who have traditional Medicare only from those who have Medicare advantage is not available in the HRS dataset, and both groups are therefore included in the Medicare only group. Long-term care insurance is included as a separate binary variable as whether or not they had some long-term care insurance in 1998.

Analytic Methods

We conducted descriptive analyses of demographic and socioeconomic characteristics at baseline comparing study participants who were newly covered by Medicaid over the follow-up period with those who were not. To determine the effects of how physical and/or cognitive impairment and high out-of-pocket spending related to subsequent entry into Medicaid, we used discrete-time survival analysis methods, specifically complementary log-log models. The final model adjusts for age at baseline (including a quadratic term to reflect a non-linear relationship between age and Medicaid entry), gender, race, ethnicity, marital status at baseline, income level relative to federal poverty level at baseline, household assets at baseline, home ownership, long-term care insurance coverage at baseline, and employer health insurance or Medigap supplementary insurance status at baseline. For all analyses, the 1998 sample weights that account for the complex sampling strategy of the HRS were applied to generate nationally representative results.

Limitations

A limitation of this study is the reliance on self-reported variables, particularly out-of-pocket spending. As indicated by Hurd and Rohwedder, these measures are subject to recall error, ambiguity, and anchoring to the initial value provided within

an unfolding bracket question sequence.¹³ While the HRS's measure for out-of-pocket health care expenditures tend to be slightly higher (particularly at the top end of the distribution) compared to other surveys like the Medicare Current Beneficiary Survey and the Medical Expenditure Panel Survey, these differences have reduced over time.^{13,14} For this reason, OOP health care expenditure has been top-coded at the 95th percentile. Self-reported Medicaid coverage is also subject to misclassification. For those who report being covered by Medicaid, the HRS asks that these individuals show their Medicaid cards for confirmation, although not all do.^{4,6} We are unable to differentiate the out-of-pocket spending that relates to medical versus long-term services and supports spending due to the way the spending questions were asked in the earlier rounds of the HRS.

In this analysis, we do not control for changes that may occur over the 16-year period for variables such as income (as measured by FPL). To do so with FPL would over-adjust the model, given an individual's FPL is used to determine their Medicaid eligibility. Instead, we control for the income level relative to federal poverty reported in 1998 and examine the trajectories into Medicaid from this starting point. While this study examines longitudinal relationships over a 16-year follow-up period, as an observational study with predefined measures, we are unable to definitively untangle the complex relationships of interest to establish causality.

STUDY RESULTS

Characteristics of Dually Eligible Beneficiaries and Other Medicare Beneficiaries

Table 1 shows the descriptive analysis of the baseline characteristics of the population sample by those who gained Medicaid coverage and those who did not. Overall 13 % of Medicare beneficiaries became covered by Medicaid over the 16-year period. The mean age at baseline was the same for both groups at 75 years. The population who became covered by Medicaid over the follow-up period was more likely to be female (66 versus 56 %), black (18 versus 5 %), Hispanic (7 versus 3 %), and not married (55 versus 39 %) compared to those who did not enter Medicaid over the follow-up period. The group that became covered by Medicaid was more likely to be below 200 % of the FPL in 1998 compared to those who did not (60 versus 30 %), although not all had low incomes initially. Twenty-eight percent of those who became covered by Medicaid had household incomes between 200 and 400 % of FPL, and 12 % had household incomes above 400 % of FPL at baseline.

Individuals who gained Medicaid coverage during the follow-up period were less likely to have supplemental health insurance in the form of Medigap or employer-sponsored insurance in 1998 (50 versus 70 %) or long-term care insurance (5 versus 12 %). Over time, those gaining Medicaid coverage were more likely to have high out-of-pocket spending at some point during the follow-up period compared to those who did not become covered by Medicaid (70 versus 52 %). Finally, study participants who gained Medicaid coverage were more likely to have physical and/or cognitive impairment compared to those who did not enter into Medicaid (63 versus 48 %).

High Out-of-Pocket Spending by Income and Physical and/or Cognitive Impairment

We examined the extent of the high out-of-pocket spending by income groups in 1998. The prevalence of high out-of-pocket spending is highest at lower income groups, with 70 % of those below 100 % FPL having high out-of-pocket spending

TABLE 1 Characteristics of Medicare beneficiaries ages 65 and older who gained Medicaid coverage between 1998 and 2014

Number of observations 9298			
Population size 28,601,610			
	Ever Medicaid during follow-up		Total sample
	No	Yes	
Population	87 %	13 %	100 %
Gender	Column percent	Column percent	Column percent
Male	44 %	34 %	43 %
Female	56 %	66 %	57 %
Race			
White	93 %	78 %	91 %
Black	5 %	18 %	7 %
Other	2 %	4 %	2 %
Ethnicity			
Not Hispanic	97 %	93 %	97 %
Hispanic	3 %	7 %	3 %
Marital status in 1998			
Married/partnered	61 %	45 %	59 %
Separated/divorced	6 %	12 %	6 %
Widowed	30 %	41 %	32 %
Never married	3 %	3 %	3 %
Federal poverty level in 1998			
0–100 %	6 %	24 %	9 %
100–150 %	11 %	21 %	12 %
150–200 %	13 %	15 %	13 %
200–400 %	37 %	28 %	36 %
400 %+	33 %	12 %	30 %
Household assets in 1998			
<\$100,000	33 %	66 %	37 %
>\$100,000	67 %	34 %	63 %
Health insurance in 1998			
Medicare only and Medicare advantage	30 %	50 %	33 %
Employer sponsored	33 %	20 %	31 %
Medigap	37 %	30 %	36 %
Long-term care insurance in 1998			
No	88 %	95 %	89 %
Yes	12 %	5 %	11 %
Ever high OOP during follow-up			
No	53 %	30 %	50 %
Yes	47 %	70 %	50 %
Type of PCI developed during follow-up			
None	52 %	37 %	50 %
Physical impairment only	12 %	12 %	12 %
Cognitive impairment	36 %	52 %	38 %

Source: authors' analysis of data from the Health and Retirement Study, 1998–2014. Not all column percentages will equal 100 % due to rounding. All results are percentages based on the weighted sample

between 1998 and 2014. High levels of out-of-pocket spending largely persist up to 200 % FPL; high out-of-pocket spending drops from 58 % of those between 150

and 200 % FPL to 49 % for those between 200 and 400 % of FPL. While it is certainly the case that high out-of-pocket spending is prevalent among those with lower incomes, Fig. 1 illustrates the pervasiveness of high out-of-pocket spending across all income groups, particularly for those who have physical and/or cognitive impairment. For the lowest income group (<100 % FPL), the level of out-of-pocket spending is very high regardless of physical and/or cognitive impairment. Figure 1 shows that those individuals with incomes between 100 and 150 % FPL and 150 and 200 % FPL have exceptionally high levels of out-of-pocket spending, which may place them at increased risk for becoming covered by Medicaid.

Medicare beneficiaries with physical and/or cognitive impairment are particularly vulnerable to high out-of-pocket health care expenditures as a proportion of their income (Table 2). Among those with physical and/or cognitive impairment, the highest out-of-pocket spending is by those who have functional physical impairment only, with the exception of the lowest income group. In 1998, average OOP spending was between approximately 16 % of annual household incomes for those below <200 % FPL with cognitive impairment and functional impairment. This is almost double the proportion of income spent on OOP medical expenditures by those without physical and/or cognitive impairment in the same income categories.

Entry into Medicaid

We examined the impact of high out-of-pocket spending and having physical and/or cognitive impairment on entry into Medicaid among older adults with Medicare. Using discrete-time survival methods, we examined the relationship between high out-of-pocket spending and physical and/or cognitive impairment with Medicaid entry while adjusting for age, gender, race, ethnicity, marital status, long-term care insurance, health insurance, individual income relative to the 1998 federal poverty level, household assets, and home ownership in 1998. Figure 2 graphically represents the results of the survival model and shows the differences in trajectory

FIG. 1 Proportion of Medicare beneficiaries ages 65 and older with high out-of-pocket spending by PCI status and federal poverty level in 1998. Source: authors' analysis of data from the Health and Retirement Study, 1998–2014.

TABLE 2 Mean (median) out-of-pocket health care expenditures as a proportion of annual household income in 1998 by PCI status

FPL	No PCI	Physical impairment only	Cognitive impairment
<100 %	12.32 % (5.28 %)	23.27 % (12.7 %)	28.13 % (6.64 %)
100–150 %	9.25 % (3.71 %)	15.02 % (6.13 %)	10.88 % (4.45 %)
150–200 %	5.56 % (2.87 %)	10.32 % (5.11 %)	8.23 % (3.8 %)
200–400 %	3.79 % (1.73 %)	7.75 % (3.78 %)	4.93 % (1.82 %)
400 %+	1.8 % (0.76 %)	3.85 % (1.73 %)	2.18 % (0.95 %)
Total	4.08 % (1.39 %)	10.26 % (3.87 %)	6.8 % (1.97 %)

Source: authors' analysis of data from the Health and Retirement Study, 1998

to entering Medicaid. Those least at-risk for Medicaid entry over time are those who never experience high out-of-pocket spending and never incur physical and/or cognitive impairment; approximately 10 % of such individuals gained Medicaid coverage over the follow-up period.

The most at-risk for Medicaid entry are those who have high out-of-pocket spending and have physical and/or cognitive impairment, of which 19 % entered into Medicaid coverage by the end of the follow-up period, controlling for all other covariates. The results of the multivariate analysis, shown in Table 3, indicate that individuals who have physical and/or cognitive impairment have a 49 % increased risk of Medicaid entry compared to those who do not have physical and/or cognitive impairment. If these individuals also have high out-of-pocket spending, the relative risk of going on Medicaid is increased to 94 % compared to those who do not have physical and/or cognitive impairment and high out-of-pocket costs. Having high out-of-pocket costs and no physical and/or cognitive impairment increases the risk of entering into Medicaid by 51 %, compared to those without high out-of-pocket costs and no physical and/or cognitive impairment. Having supplemental insurance at baseline reduced the risk of entering into Medicaid by 36 % if employer-sponsored and 25 % if Medigap compared to those with Medicare only. Those who had long-term care insurance had a 36 % reduced risk of entering into Medicaid compared to those who did not have long-term care insurance.

FIG. 2 Entry into Medicaid over time by physical and/or cognitive impairment (PCI) and high out-of-pocket spending among Medicare beneficiaries ages 65 and older in 1998. Source: authors' analysis of data from the Health and Retirement Study, 1998–2014.

TABLE 3 Adjusted hazard ratios of entry into Medicaid

Characteristics	Hazard ratio	<i>P</i> value	95 % CI
Age (years)	1.055	0.503	0.9–1.236
Gender (ref: male)	0.976	0.750	0.84–1.134
Race (ref: white)			
Black	1.785	<0.001	1.508–2.113
Other	1.322	0.084	0.962–1.817
Ethnicity (ref: not Hispanic)	1.327	0.066	0.98–1.796
Marital status in 1998 (ref: married/partnered)			
Separated/divorced	1.093	0.470	0.855–1.397
Widowed	1.012	0.891	0.853–1.201
Never married	0.838	0.484	0.507–1.385
Federal poverty level in 1998 (ref >400 %)			
0–100 %	4.213	<0.001	3.117–5.694
100–150 %	2.582	<0.001	1.954–3.411
150–200 %	1.841	<0.001	1.409–2.406
200–400 %	1.591	0.001	1.214–2.085
Assets >\$100,000 (ref: no)	0.521	<0.001	0.445–0.609
Own home (ref: no)	0.692	<0.001	0.61–0.786
Health insurance in 1998 (ref: Medicare)			
Employer sponsored	0.633	<0.001	0.527–0.759
Medigap	0.753	<0.001	0.648–0.874
Long-term care insurance in 1998 (ref: no)	0.644	<0.001	0.509–0.816
Interaction term of high OOP and integrated care needs status (ref: no high OOP: no ICN)			
No high OOP: ICN	1.493	0.005	1.135–1.963
High OOP: no ICN	1.508	0.004	1.143–1.988
High OOP: ICN	1.940	<0.001	1.431–2.63

Source: authors' analysis of data from the Health and Retirement Study, 1998–2014

Medicare beneficiaries below 200 % FPL experience far greater rates of transition into Medicaid than those above 200 % FPL. When individuals have high OOP medical expenditures, the rates for Medicaid entry among the lower income groups are even more striking, reaching as high as 51 % among those below 100 % FPL who have high out-of-pocket spending with physical and/or cognitive impairment (results not shown).

DISCUSSION AND IMPLICATIONS

Low-income older adults with physical and/or cognitive impairment are most likely to gain Medicaid coverage. Not surprisingly, those who entered into Medicaid over the 16-year course of the study were more likely to be female, belong to a racial/ethnic minority group, be widowed, or have low incomes at the beginning of the period. But it is striking that two fifths of those who gained Medicaid coverage had incomes above twice the federal poverty level in 1998. In line with other studies, the findings of this analysis show how the risk of entry into Medicaid varies substantially by baseline FPL.^{4,15} Study results indicate that less than half (45 %) of Medicare beneficiaries who gained Medicaid coverage had incomes below 150 % of the poverty level in 1998, with 15 % falling in the 150–200 % of poverty income range. Medicaid is truly a middle-class program for older Americans as their health and ability to live independently decline.

The implications of study findings for Medicare, Medicaid, and Social Security income security programs are significant and underscore the importance of examining policies that have the potential to alter these life courses. Reducing the numbers of older adults who enter into Medicaid is highly relevant to state and federal policy-makers. One risk factor that can be modified is the degree to which older adults on Medicare have high out-of-pocket spending. OOP health costs can be particularly burdensome for lower income groups, which is why Medicaid is designed to supplement Medicare coverage and cover some of the OOP expenditures. Half of the total sample had high out-of-pocket spending relative to income at some point over the 16 years including 70 % who eventually qualified for Medicaid.

High out-of-pocket expenses may result from the deductibles and coinsurance for covered Medicare services, as well as the exclusion from the Medicare benefit package of costly essential services such as dental care, hearing and vision services, and long-term services and supports. Individuals with high out-of-pocket spending who have physical and/or cognitive impairment were at a much higher risk of entering Medicaid than those who did not. We found that the risk of entering Medicaid was reduced for those with supplemental insurance, emphasizing the importance of comprehensive coverage to avoid entry into Medicaid. Since one of the goals of the Medicare program is to protect beneficiaries against the financial hardship of health care expenses, improving the Medicare benefit package or setting a limit on out-of-pocket expenses at a level that is affordable for beneficiaries could improve the economic security of beneficiaries.

Becoming physically limited or cognitively impaired greatly increases the likelihood of entering Medicaid. While 10 % of those without a physical and/or cognitive impairment became covered by Medicaid over the 16-year period, 19 % of those with a physical and/or cognitive impairment and high out-of-pocket spending were covered by Medicaid at the end of the period. To the extent Medicare itself included a targeted LTSS benefit,¹⁶ the enhanced benefit could postpone Medicaid eligibility. Or alternatively, if Medicaid offered some support for near-poor Medicare beneficiaries with functional impairments, it could delay deterioration and/or prevent repeat hospitalization and emergency care.

CONCLUSION

As Atul Gawande has noted, “We think our job is to ensure health and survival. But really it is larger than that. It is to enable well-being.”¹⁷ Financial security and quality of life among older Americans would benefit from redesigning health and income security policies to achieve this broader goal. The Medicaid program serves as an essential insurance safety net for all older Americans as they face the vicissitudes of aging. No one knows when a stroke or the onset of dementia will pose a serious threat to their health and functioning.

The well-being of older Americans can also be enhanced by intervening sooner to prevent reduced economic circumstances as a consequence of high out-of-pocket spending on health care. Improving Medicare benefits to ensure that no beneficiary is faced with burdensome out-of-pocket expenses is one feasible step. This involves not just setting a limit on out-of-pocket expenses as do health insurance policies for those under age 65 but also broadening the benefit package to cover services which are particularly important to older populations including hearing aids, dental care, and home and community-based services needed to support independent living.^{16,18}

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