Financial loss in pyramid savings schemes, downward social mobility and acute coronary syndrome in transitional Albania

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ABSTRACT

Objective: Extensive financial losses caused by the collapse of pyramid savings schemes led to the 1997 turmoil in Albania. The authors' aim was to assess the association of financial loss and social mobility with acute coronary syndrome (ACS) 6–9 years after the precipitous collapse.

Methods: A population-based case–control study was conducted in Tirana, the Albanian capital, in 2003–6. 467 non-fatal consecutive ACS patients were recruited (370 men aged 59.1 (SD 8.7) years and 97 women 63.3 (SD 7.1) years, 88% response). The control group comprised 469 men (53.1 (SD 10.4) years) and 268 women (54.0 (SD 10.9) years, 69% response). Information on the absolute financial loss (in US$), relative loss and subjective social mobility was obtained by a structured interviewer-administered questionnaire. Associations of financial loss and social mobility with ACS were assessed by multivariable-adjusted logistic regression.

Results: Financial loss in pyramid scams was frequent in both ACS patients (55%) and controls (41%). Downward subjective social mobility was noted in 31% of patients and 12% of controls. Upon adjustment for sociodemographic and socioeconomic characteristics and conventional coronary risk factors, ACS was associated with both financial loss (OR 1.9, 95% CI 1.4 to 2.6) and downward social mobility (OR 2.2, 95% CI 1.4 to 3.3). Although the association with financial loss was partly mediated through subjective social mobility, both maintained independent associations with ACS.

Conclusions: In the wake of a nationwide catastrophic collapse of savings that led to losses totalling about 40% of the Albanian gross domestic product, the authors detected apparent long-term deleterious health effects of financial loss and downward intragenerational subjective social mobility.

In Albania, the transition from a socialist economy to a free-market orientation was severely undermined in March 1997 by the collapse of savings schemes known as "pyramids".[1] The pyramid phenomenon, to a certain extent experienced by most of the transitional countries in southeast Europe,[2] was nevertheless unique in Albania due to the extremely large scale of involvement. It is estimated that almost two-thirds of the Albanian population took part in these savings schemes, and that the total sum lost exceeded US$1 billion[1] in a country whose total gross domestic product was not more than US$2.5 billion.[3] The social consequences of this collapse were immense, and anomie reigned for a prolonged period. More than 2000 civilians were killed in the ensuing turmoil

and about 600 000 military weapons were seized by civilians.[2] Ten years later, Albania remains enveloped by the pyramid effect, and its sequelae are still shaping the political, economic and social environment. However, the health impact of the extensive pyramid losses remains to be investigated.

In Tirana, the capital of Albania, admissions for coronary heart disease (CHD) increased markedly in 1997–8 (Celiku N, Statistics Unit, Tirana, personal communication), later declining to a level above that prevailing before the collapse, but these data may be confounded by substantial internal migration. According to official statistics, CHD mortality has increased in Albania over the past decade.[4]

Social disruption and anomie have been associated with health consequences other than violence.[5] There is little evidence to the effects on cardiovascular disease occurrence of sudden unexpected financial collapse involving large segments of the population. These effects have been noted in mass events such as earthquakes[6] and the stress of missile attacks.[7] An extensive body of literature exists regarding the untoward health effects of stressful life events.[8][9] Adverse life events including financial problems have been related to overall mortality[10] and coronary heart disease (CHD) occurrence and mortality.[11][12] In addition, downward intragenerational social mobility has been linked to an excess risk for cardiovascular death.[13]

In this context, we assessed the long-term association of financial loss and social mobility with CHD among residents of Tirana 6–9 years after the collapse of the pyramid scams. We hypothesized an association between financial loss and downward social mobility, a deleterious effect of both loss and downward mobility on coronary health and a larger impact of relative financial loss than absolute loss.

METHODS

Study population

A population-based case–control study of acute coronary syndrome (ACS) was conducted in Tirana in 2003–6. Details of the study population, sampling procedures and case definition are described elsewhere.[14] Briefly, we recruited 467 consecutive non-fatal cases of ACS, ages 35–74 years, admitted to the University Hospital Center, the only hospital in Tirana (370 men aged 59.1 (SD 8.7) years, and 97 women 63.3 (7.1) years; 88% response); 301 patients experienced a first ACS

event and 166 had repeat events. The definition of ACS was based on combinations of clinical signs and symptoms, ECG and echocardiographic criteria and elevated cardiac enzymes. The control group comprised a population-based age-stratified and sex-stratified sample of Tirana residents aged 35–74 years (469 men aged 53.1 (SD 10.4) years, and 268 women 54.0 (SD 10.9) years), with an overall response rate of 69.2% (737/1065).[14] Control group refusals (96 men and 87 women) provided information on age, educational level, employment status and religious affiliation; for those who could not be located (82 men and 63 women), we had information on age and religion. Male control non-respondents were moderately older than respondents (55.1 (SD 10.7) years vs 53.1 (SD 10.5) years, p = 0.03) and were significantly more likely to be retired (age-adjusted OR 3.8, 95% CI 1.8 to 7.7), but were similar in regard to religion and educational level. Female control non-respondents did not differ materially from participants by age, religion, employment status or education.

54 of the 737 control respondents with evidence of pre-existing CHD were excluded from the analysis. Of the remaining 1150 individuals (467 ACS cases and 683 controls), 1097 participants (95%) provided data on financial loss, subjective social mobility and most covariates (465 cases and 632 controls, 782 men and 315 women). The other 53 participants did not provide data on either financial loss or subjective social mobility (n = 5), or did not provide information on a large number of covariates including physical measurements (n = 48). Inclusion in key age-adjusted analyses of these 48 individuals who had data on financial loss did not affect the estimates. Therefore, we report results after the exclusion of all 53 participants with important missing data.

Data collection
Information on demographic and socioeconomic characteristics (education, employment status and relative income), current smoking status, leisure-time exercise, self-reported hypertension, diabetes and family history of CHD was obtained by interview using a structured questionnaire, as previously reported.[14]

Participants were also asked if they had experienced financial loss in the pyramid collapse and the extent of the absolute household loss (in US$) grouped as <$2000, $2000–4900, $5000–9900, $10 000–15 000 and >$15000. Relative loss (for individuals who reported financial loss) was calculated as a summary score of three items tapping participants' self-perceived financial loss relative to (a) what they possessed before the collapse; (b) financial losses of their relatives, friends, or neighbours; (c) financial losses of compatriots in general. The score for each item ranged from 0 (insignificant/negligible loss) to 5, giving a summary score of 0–15. Cronbach's alpha of the three-item scale was 0.92–0.95 for male and female patients and controls.

We assessed the subjective social position using an instrument adapted from Adler et al.[15] Individuals were shown a five-step ladder representing where people stand in Albanian society. The top of the ladder (score 5) depicted people who were the most well off—with the most money, most education and the best jobs; at the bottom (score 1) were the people who were the worst off. Participants were asked to position themselves on this ladder at the time of interview and in 1996. Subjective social position has been shown to be a valid proxy measure of socioeconomic status.[16] Subjective social mobility was assessed as the difference between current social position and social position in 1996. The possible range of subjective social mobility

scores was from −4 (maximal downward drifting) to +4 (maximal upward movement). In the analyses, absolute loss was dichotomized into <$5000 and ≥$5000, relative loss was dichotomized at its median score, separately in men and women, and subjective social mobility was dichotomized into downward drifting versus no change or upward mobility. Analyses were repeated with these variables treated as ordinal or interval scales.

To assess relative income participants were informed about the average per capita income in Albania (according to the last available official data) and, based on this, they were asked to rank their personal income on a five-point scale, which we grouped into three (much lower/lower, about the same and higher/much higher) because of too few observations at the extremes. Measurement of weight, height and waist and hip circumferences was carried out by the same examiners equally in both cases and controls.[14]

The study was approved by the Albanian Committee of Medical Ethics. Participants gave written consent after being informed about the aims and procedures of the study.

Statistical analysis
We used sex-specific binary logistic regression to assess the association of financial loss and subjective social mobility with covariates and with ACS. Age-adjusted or age- and sex-adjusted odds ratios (ORs), their 95% confidence intervals (CIs) and p-values were calculated. Next, smoking, leisure-time exercise, hypertension, diabetes, family history of CHD, body mass index and waist-to-hip ratio were introduced together with the financial loss variables (absolute or relative loss) or subjective social mobility into models with ACS as the dependent variable. Subsequently, socioeconomic variables were added. To assess the associations of financial loss and subjective social mobility with ACS, independently of one another, models mutually adjusted also for these variables were run. We repeated the analyses after exclusion of the retirees. Finally, we applied multinomial logistic models to compare the associations for first and repeat ACS events. The Hosmer–Lemeshow test was used to assess goodness-of-fit; all models met the criterion. The Statistical Package for Social Sciences (SPSS for windows, version 11.0, Chicago, Illinois) was used for all the statistical analyses.

RESULTS
ACS patients were older than controls (p<0.01 in both sexes—a difference that resulted from the mode of selection of controls[14]), were more likely to be retired (age- and sex-adjusted OR 3.7, 95% CI 2.5 to 5.5) and to be Muslims (OR 1.6, 95% CI 1.2 to 2.2), but did not differ significantly by educational level (OR for >12 years of education vs 0–8 years 1.2, 95% CI 0.8 to 1.7).

Pyramid financial loss was very frequent in both ACS patients (55%) and controls (41%) (table 1). A total of 17% of cases and 11% of controls reported a financial loss of at least $5000.

Absolute and relative loss were strongly correlated (in men, Pearson r = 0.78 in ACS cases and r = 0.81 in controls; in women: r = 0.83 and r = 0.79, in cases and controls respectively). A higher proportion of ACS patients had relative loss scores above the median than the controls (29% vs 19%, respectively). Cases reported a considerably higher rate of downward drifting in subjective social position than controls (31% vs 12%) (table 1).

Research report

Table 1 Distribution of financial loss in pyramid schemes and subjective social mobility in acute coronary syndrome patients and controls

Variable	Acute coronary syndrome patients			Controls		
	Men (n = 369)	Women (n = 96)	Overall	Men (n = 413)	Women (n = 219)	Overall
Financial loss in pyramid schemes						
No	170 (46.1)*	40 (41.7)	210 (45.2)	240 (58.1)*	131 (59.8)	371 (58.7)
Yes	199 (53.9)	56 (58.3)	255 (54.8)	173 (41.9)	88 (40.2)	261 (41.3)
Absolute loss (in $US)						
No loss	170 (46.1)	40 (41.7)	210 (45.2)	240 (58.1)	131 (59.8)	371 (58.7)
<5000	138 (37.4)	36 (37.5)	174 (37.4)	126 (30.5)	67 (30.6)	193 (30.5)
⩾5000	61 (16.5)	20 (20.8)	81 (17.4)	47 (11.4)	21 (9.6)	68 (10.8)
Relative loss†						
No loss	170 (46.1)	40 (41.7)	210 (45.2)	240 (58.1)	131 (59.8)	371 (58.7)
Below median	99 (26.8)	22 (22.9)	121 (26.0)	85 (20.6)	54 (24.7)	139 (22.0)
Above median	100 (27.1)	34 (35.4)	134 (28.8)	88 (21.3)	34 (15.5)	122 (19.3)
Subjective social mobility‡						
No change	243 (65.9)	49 (51.0)	292 (62.8)	324 (78.3)	152 (69.7)	476 (75.3)
Downward drifting	99 (26.8)	43 (44.8)	142 (30.5)	50 (12.1)	28 (12.8)	78 (12.3)
Upward movement	27 (7.3)	4 (4.2)	31 (6.7)	40 (9.7)	38 (17.4)	78 (12.3)

*Number and column percentages (in parenthesis). Slight discrepancies in totals are due to partially missing data (for economic loss or subjective social mobility).
†For each individual, relative loss was calculated as a summary score of three items tapping the self-perceived financial loss compared with (a) what individuals possessed at the time of collapse of pyramid schemes; (b) losses of relatives, friends or neighbours; and, (c) losses of compatriots in general. The score for each item ranged from 0 (insignificant/negligible loss) to 5. The summary score for the three items had a range from 0 to 15. Below median scores were 0–6 in men and 0–7 in women; above median scores were 7–15 in men and 8–15 in women.
‡For each individual, subjective social mobility was calculated as the difference between self-assessed current social position and social position in 1996 (both with a range from 1 (lower) to 5 (upper)). Range of subjective social mobility score was from −4 (maximal downward drifting) to +4 (maximal upward mobility). No change/upward mobility corresponds to scores ⩾0, whereas downward drifting corresponds to scores <0.

In the control group (table 2), financial loss tended to be more frequent in younger individuals, whereas those who reported downward social drifting were modestly older than individuals who reported no change or upward mobility. There was a very strong association of financial loss with downward social mobility (OR 7.4, 95% CI 4.1 to 13.2) that was replicated in the ACS patients (OR 7.9, 95% CI 4.7 to 13.2). Downward mobility was related to lower income, less education, and unemployment and retirement. Similar associations were noted in ACS patients.

There were no significant associations of financial loss with any of the classical CHD risk factors (not shown), except for a positive relationship with current smoking. Downward social mobility was, however, associated with hypertension, diabetes and male pattern abdominal obesity.

In age-adjusted analyses with age introduced in discrete years as an interval variable (table 3), there was an association of financial loss with ACS (age- and sex-adjusted OR 2.0, 95% CI 1.5 to 2.6). The excess risk was similar in those who had lost <$5000 and those who had lost ⩾$5000 (OR 1.9, 95% CI 1.4 to 2.6, and OR 2.1, 95% CI 1.4 to 3.1, respectively), and in individuals with below and above median scores of relative loss (OR 1.9, 95% CI 1.3 to 2.6, and OR 2.0, 95% CI 1.5 to 2.8, respectively). There was no evidence for a graded association when the full scales for absolute and relative loss were entered into the models. Downward subjective social mobility was quite strongly associated with ACS (OR 2.6, 95% CI 1.9 to 3.7), an effect that did not differ significantly between individuals who reported financial loss and among those who did not. Introduction of age as a categorical dummy variable in 10-year (for sex-specific analysis) and 5-year (for sex-pooled analysis) age bands did not alter the findings.

The association of financial loss with ACS remained largely unchanged in models adjusted for conventional CHD risk factors and socioeconomic variables (OR 1.9, 95% CI 1.4 to 2.6), whereas further adjustment for subjective social mobility

tended to attenuate the strength of relationship (OR 1.6, 95% CI 1.1 to 2.2) (table 4, upper panel). Additional adjustment for measures of family size and marital status did not affect the findings in either sex. There was no meaningful difference in multivariable models with loss measured in absolute or in relative terms. The association of subjective social mobility with ACS diminished somewhat on multivariable adjustment (OR 2.2, 95% CI 1.4 to 3.3), and more so with further adjustment for financial loss (OR 1.7, 95% CI 1.1 to 2.7) (table 4, lower panel). There was a graded response to change in subjective social position: multivariable-adjusted ORs for ⩾1 step increase (n = 109), no change (n = 768), 1 step reduction (n = 178) and ⩾2 step reduction (n = 42) were 1.0, 1.6 (95% CI 0.9 to 3.0), 3.2 (95% CI 1.6 to 6.4) and 4.1 (95% CI 1.4 to 11.7), respectively.

There was a stronger association with repeat ACS events than with first events for both financial loss (combined sexes, multinomial logistic models adjusted for socioeconomic and coronary risk factors: OR 2.8, 95% CI 1.9 to 4.3, and OR 1.6, 95% CI 1.2 to 2.3, respectively; and subjective social mobility (OR 3.1, 95% CI 1.9 to 5.1, and OR 2.0, 95% CI 1.3 to 3.0, respectively. Among the 166 patients with repeat ACS events, the initial event occurred before the pyramid collapse in 44 and afterwards in 122 patients. The association of both financial loss and subjective social mobility with repeat ACS was evident irrespective of the timing of the first event (data not shown).

In men, exclusion of retirees slightly accentuated the association with financial loss.

DISCUSSION

The main finding of our study was that 6–9 years after the collapse of the pyramid schemes in Albania financial loss and downward subjective social mobility were each independently associated with an increased risk of admission for ACS. Although the association with financial loss was partly mediated through subjective social mobility and the effect of social mobility was partly explained by pyramid losses, both

Table 2 Association of financial loss in pyramid schemes and subjective social mobility with socioeconomic characteristics in the control group; age- and sex-adjusted odds ratios (ORs) from binary logistic regression

Variable	Financial loss (n = 632)				Social mobility (n = 632)			
	No loss	Loss	OR (95% CI)*	p	No change/upward	Downward drifting	OR (95% CI)†	p
Age (in years)	52.16 (SD 9.87)‡	50.77 (SD 9.84)	0.99 (0.97 to 1.00)	0.08	51.26 (9.80)‡	53.46 (10.12)	1.02 (1.00 to 1.05)	0.07
Education				0.14 (2)§				<0.01 (2)§
>12 years	83 (22.4)¶	50 (19.2)	1.00 (reference)	–	118 (21.4)¶	15 (19.2)	1.00 (reference)	–
9–12 years	153 (41.4)	129 (49.4)	1.40 (0.92 to 2.14)	0.12	260 (47.1)	21 (26.9)	0.63 (0.31 to 1.27)	0.20
0–8 years	134 (36.2)	82 (31.4)	1.03 (0.66 to 1.61)	0.91	174 (31.5)	42 (53.8)	1.88 (0.99 to 3.55)	0.05
Test for linear trend				0.91				0.05
Employment				0.28 (2)				0.17 (2)
Employed	196 (52.8)	148 (56.7)	1.00 (reference)	–	311 (56.1)	33 (42.3)	1.00 (reference)	–
Unemployed	108 (29.1)	68 (26.1)	0.80 (0.54 to 1.18)	0.25	152 (27.4)	25 (32.1)	1.64 (0.92 to 2.92)	0.09
Retired	67 (18.1)	45 (17.2)	1.30 (0.74 to 2.25)	0.36	91 (16.4)	20 (25.6)	1.64 (0.75 to 3.57)	0.22
Relative income				0.33 (2)				<0.01 (2)
Higher	211 (56.9)	157 (60.2)	1.00 (reference)	–	335 (60.5)	33 (42.3)	1.00 (reference)	–
About the same	110 (29.6)	79 (30.3)	0.97 (0.68 to 1.39)	0.87	168 (30.3)	21 (26.9)	1.26 (0.71 to 2.25)	0.44
Lower	50 (13.5)	25 (9.6)	0.67 (0.40 to 1.14)	0.14	51 (9.2)	24 (30.8)	4.80 (2.62 to 8.79)	<0.01
Test for linear trend				0.14				<0.01
Subjective social mobility								
No change/upward	354 (95.7)	199 (76.2)	1.00 (reference)	–				
Downward drifting	16 (4.3)	62 (23.8)	7.35 (4.10 to 13.16)	<0.01				

*OR: financial loss versus no loss.
†OR: downward drifting versus no change/upward mobility.
‡Mean (SD).
¶Number and column percentages (in parenthesis). Discrepancies in the totals are due to missing covariate values.
§Overall significance and degrees of freedom (in parenthesis).

maintained independent associations with ACS. These associations persisted after multivariable adjustment for recognized predictors of CHD: sociodemographic, socioeconomic and conventional risk factors, and appeared to be stronger for repeat than for first events of ACS. The effect of financial losses was similar regardless of family size. Absolute and relative loss were strongly correlated and were similarly associated with ACS risk, the latter contrary to our expectation. There was no evidence for a graded association according to the extent of the absolute or relative financial loss (ie, no "dose effect") in contrast with social mobility.

A review of 14 prospective studies concluded that, generally, life events adversely affect CHD.[17] However, these studies have commonly reported aggregated effects of undesirable life events, including, though not dealing specifically with, major financial difficulties. We were able to explore the later health effects of sudden, largely unforeseen and serious financial losses in a population in which a particularly high proportion suffered monetary damage. Although there is a hint of short-term effects on coronary events in this population based on hospital admissions for myocardial infarction, our study provides evidence for mid-term to long-term effects in both men and women in Albania. One may argue that the collapse of pyramid

Table 3 Association of financial loss and subjective social mobility with acute coronary syndrome; age-adjusted odds ratios (ORs) from binary logistic regression

Variable	Men			Women			Overall	
	n*	OR (95% CI)	p	n	OR (95% CI)	p	OR (95% CI)†	p
Financial loss in pyramid scams								
No	410	1.00 (reference)	–	171	1.00 (reference)	–	1.00 (reference)	–
Yes	372	1.77 (1.30 to 2.41)	<0.01	144	2.66 (1.49 to 4.74)	<0.01	1.95 (1.48 to 2.55)	<0.01
Absolute loss (in $US)			<0.01 (2)‡			<0.01 (2)		<0.01 (2)
No loss	410	1.00 (reference)	–	171	1.00 (reference)	–	1.00 (reference)	–
<5000	264	1.71 (1.22 to 2.40)	<0.01	103	2.75 (1.44 to 5.27)	<0.01	1.89 (1.40 to 2.55)	<0.01
≥5000	108	1.93 (1.21 to 3.08)	0.01	41	2.48 (1.09 to 5.64)	0.03	2.09 (1.40 to 3.13)	<0.01
Relative loss			<0.01 (2)			<0.01 (2)		<0.01 (2)
No loss	410	1.00 (reference)	–	171	1.00 (reference)	–	1.00 (reference)	–
Below median	184	1.81 (1.24 to 2.65)	<0.01	76	2.31 (1.11 to 4.79)	0.02	1.88 (1.34 to 2.63)	<0.01
Above median	188	1.73 (1.19 to 2.53)	<0.01	68	2.99 (1.50 to 5.98)	<0.01	2.02 (1.45 to 2.81)	<0.01
Subjective social mobility								
No change/upward	634	1.00 (reference)	–	243	1.00 (reference)	–	1.00 (reference)	–
Downward drifting	149	2.21 (1.48 to 3.29)	<0.01	71	3.91 (2.04 to 7.48)	<0.01	2.63 (1.87 to 3.70)	<0.01

*Number of individuals by variable category. Discrepancies in totals are due to missing covariate values.
†Adjusted also for sex.
‡Overall significance and degrees of freedom (in parenthesis).

Table 4 Association of financial loss and subjective social mobility with acute coronary syndrome; multivariable-adjusted odds ratios (ORs) from binary logistic regression

Variable	Men			Women			Overall	
	n*	OR (95% CI)	p	n	OR (95% CI)	p	OR (95% CI)†	p
Upper panel: Models with financial loss								
Model 1‡								
No	405	1.00 (reference)	–	162	1.00 (reference)	–	1.00 (reference)	–
Yes	359	1.72 (1.21 to 2.45)	<0.01	136	2.70 (1.31 to 5.58)	0.01	1.90 (1.40 to 2.57)	<0.01
Model 2¶								
No	404	1.00 (reference)	–	160	1.00 (reference)	–	1.00 (reference)	–
Yes	359	1.68 (1.16 to 2.42)	0.01	136	2.89 (1.23 to 6.80)	0.01	1.88 (1.37 to 2.58)	<0.01
Model 3§								
No	404	1.00 (reference)	–	159	1.00 (reference)	–	1.00 (reference)	–
Yes	359	1.55 (1.04 to 2.31)	0.03	136	2.18 (0.84 to 5.66)	0.11	1.58 (1.11 to 2.23)	0.01
Lower panel: Models with subjective social mobility								
Model 1‡								
No/Upward	617	1.00 (reference)	–	230	1.00 (reference)	–	1.00 (reference)	–
Downward	148	1.77 (1.13 to 2.77)	0.01	67	4.04 (1.74 to 9.37)	<0.01	2.42 (1.66 to 3.52)	<0.01
Model 2¶								
No/Upward	615	1.00 (reference)	–	228	1.00 (reference)	–	1.00 (reference)	–
Downward	148	1.65 (1.00 to 2.71)	0.05	67	3.15 (1.12 to 8.80)	0.03	2.20 (1.45 to 3.32)	<0.01
Model 3§								
No/Upward	615	1.00 (reference)	–	228	1.00 (reference)	–	1.00 (reference)	–
Downward	148	1.31 (0.76 to 2.24)	0.33	67	2.07 (0.66 to 6.52)	0.21	1.72 (1.10 to 2.71)	0.02

*Number of individuals by variable category. Discrepancies in totals are due to missing covariate values.
†Adjusted also for sex.
‡Model 1: adjusted for age (in years), current smoking status (regular plus occasional smokers vs the rest), leisure-time exercise (tertiles of energy expenditure in Kcal/day, introduced as dummy variables), self-reported hypertension (yes vs no), diabetes (yes vs no), family history of coronary heart disease (at least one parent or sibling vs none), body mass index (<30 vs ≥30) and waist-to-hip ratio (in men: ≤0.95 vs >0.95; in women: ≤0.86 vs >0.86).
¶Model 2: adjusted also for educational level (0–8 years, 9–12 years and >12 years of formal schooling), employment status (employed, unemployed and retired), relative income (lower than compatriots (scores 1 and 2), about the same and higher (scores 4 and 5)) and current social position (lower (scores 1 and 2), middle and upper (scores 4 and 5)), all introduced as dummy variables. Further adjustment for religious affiliation (Muslim vs Christian) had no effect on the associations.
§Model 3: adjusted also for subjective social mobility (downward vs no change/upward) in models assessing the effect of financial loss, or adjusted for financial loss (yes vs no) in social mobility models.

schemes was a predictable event. Yet, this was not the case in Albania as the government in 1996 manifestly supported the companies that engaged in the fraudulent pyramid activities.[18]

Like other psychosocial factors, potential mechanisms of chronic stress (in this case, the consequences of financial loss experienced 6–9 years earlier and the costs of downward social mobility) have been suggested to operate either directly through the neuro-endocrine system,[19] or indirectly through inducement of unhealthy behaviour such as smoking, excessive alcohol consumption, unhealthy diet and sedentary lifestyle.[19] The persistence of our findings after controlling for such lifestyle factors as smoking, leisure time exercise and overweight, suggests that this indirect mediation does not explain the associations. It has been suggested that psychological distress may act chronically through pathological modifications of the cardiovascular system such as changes in lipid profile and elevation of arterial blood pressure.[20] The association in our study was also independent of classical risk factors such as hypertension, diabetes and family history, suggesting that the mediating factors leading to atherosclerotic burden and/or plaque vulnerability should be sought elsewhere (although in the absence of data on plasma lipids, this possibility remains plausible). The magnitude of the independent association of pyramid-caused financial loss was similar to that observed for the conventional CHD risk factors, as reported also by others for stressful life events.[10 12 17] Furthermore, psychosocial factors may interact synergistically with classical CHD risk factors to increase the risk of acute coronary events.[12 19] The effect of financial loss in Tirana appeared to be stronger in those with recurrent events than first events, suggesting this to be a more vulnerable subpopulation.

In our study, subjective downward mobility was strongly and consistently associated with ACS events, even in models adjusted for financial loss that accounts for the considerably higher frequency of downward drifting in individuals who reported pyramid-related losses. However, the proportion experiencing downward mobility was low relative to the proportion experiencing loss. This might be attributed to the wide scale distribution of financial loss and the relative nature of social position as determined in this study. Subjective social position, validated in the Whitehall study, has been reported to capture the standard markers of socioeconomic status free of psychological biases.[16] Furthermore, it has been suggested that the broad categorization in commonly used measures of social position may miss individual information, whereas self-placement on a ladder allows individuals to account for special circumstances which would lead to a more accurate depiction of their socioeconomic position.[16] However, this subjective measure is likely also to be more susceptible to differential misclassification than an objective social class determination in a case–control design in which patients with an acute event might downgrade their social position compared with healthy controls.

A number of reports have linked intragenerational social mobility with health outcomes. Several studies have reported an excess risk for overall mortality[13 21] and cardiovascular death[13] in downwardly mobile adults. Nonetheless, the health effects of intragenerational social mobility are controversial as downward social drifting may reflect a form of health-related selection.[13 22] Our finding that the association was evident in first events, albeit less strongly, tends to argue against the selection

hypothesis as an adequate explanation. The deleterious effects of subjective downward drifting suggested in our study could be explained by the same pathological mechanisms as for the financial loss. The alternative pathway, i.e. the effect of downward mobility operates through material circumstances and socioeconomic status in general, does not seem to play an important explanatory role because the finding persisted in the face of control for a wide array of socioeconomic factors.

Our study has the potential limitations of case–control studies of this nature that may be susceptible to biases of selection and information. Although we obtained a satisfactory response rate among cases (88%), that in the controls was lower (69%), allowing for the possibility of selection bias. In women, there was no evidence of selection bias for a number of sociodemographic variables, whereas among men, non-respondents were slightly older and more likely to be retired. However, the associations persisted undiminished after exclusion of the retirees, in support of the findings. Furthermore, with regard to education, an important socioeconomic predictor of health in the former communist countries of Central and Eastern Europe,[23] respondents and non-respondents were similar in both sexes. Although not associated with financial loss, education was markedly associated with subjective social mobility. Therefore, the absence of an educational difference in respondents and non-respondents in both sexes is reassuring. Seemingly, the instrument we used for assessment of absolute financial loss was a reasonably objective measure of a major life event. Measurement of relative financial loss stemmed from the extensive literature on the role of relative deprivation,[24] was tailored to the unique phenomenon that occurred in Albania in 1997, and was associated with a very high internal consistency. Nevertheless, reported data on financial loss, and, as noted above, in particular social position, could have been affected by case status; patients might have had a greater propensity to report financial loss and social decline. It has been argued that the associations between psychosocial measures and disease outcomes may be spurious.[25] The fact that the effect of financial loss was largely independent of social mobility in our study argues against reporting bias in ACS patients being entirely responsible for the findings. Last, we caution that this was a study of non-fatal hospitalized ACS, and that out-of-hospital coronary deaths may differ in their associations.

In conclusion, our findings suggest mid-term to long-term deleterious health consequences of financial loss as experienced so extensively in the pyramid schemes and of subjective intragenerational downward mobility, which although strongly related showed largely independent associations. Our study provides novel evidence of the apparent health effects of a nationwide "natural experiment" in which fraudulent savings schemes resulted in an exceptionally pervasive frequency of financial loss and consequent social anomie in a country undergoing rapid transition after the collapse of a rigid communist regime.

What is already known on this subject

► Stressful life events have been linked to deleterious health effects.
► Health effects of pervasive financial loss in pyramid saving schemes, a life stressor in former communist countries, have not been studied.
► Intragenerational downward mobility is associated with poor health; yet, the direction of the relationship is controversial as health selection may play a role.

What this study adds

► Financial loss in pyramid schemes was independently associated with ACS in Albania 6–9 years later.
► This effect was partly mediated through subjective downward social mobility.
► The effect of downward social mobility did not appear to be attributable to health selection bias.

Policy implications

► Healthcare providers and planners need to be aware of the social costs and potential late health sequelae of serious widespread stressor events.

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