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eTable 1 Meta-analysis or case-controlled prospective studies					
Study (year)	Type	Years	IP suicides	Place	Findings
Angst et al (2002) ⁹⁰	Cohort	22	406	Zurich	Affective disorders. Suicide mortality 10.8%, cardio- or cerebrovascular disease 34.5%. Altogether 76% died.
Axelsson and Lagerkvist-Briggs (1992) ⁹¹	Cohort	6	11	Lund	Psychotic IP. Depressed or elated mood, paranoid, prior suicidality.
Berglund and Nilsson (1987) ⁹²	Case register	18	103/1206	Lund	Severe affectives only. Males rated brittle, acute onset, marital problems. Females attempted suicide before.
Berglund (1984) ⁹³	Case register	18	88	Lund	Alcoholics only. More depressed and dysphoric, more brittle and sensitive
Berglund et al (1987b) ⁹⁴	Case register	18	67	Lund	Not affectives or alcoholics. Dependent, immature personalities overrepresented.
Brent et al (1988) ⁹⁵	Records	2	27	Pittsburgh	Adolescents. Bipolar disorder and affective disorder with comorbidity and firearm availability common
Choi et al (2012) ⁹⁶	Records	3	43	Seoul	Risk increased with suicide attempts whether admitted or not, depression.
Cohen et al (1990) ⁹⁷	Records	12	9	Wisconsin	Schizophrenia only. Young adult men at risk. Subjectively distressed, hopeless, dissatisfied with their lives.
Craig et al (2006) ⁹⁸	Cohort	5	7	New York	4 nonorganic psychosis groups. Unlike retrospective reports, suicides clustered only after 2 years.
Erlangsen et al (2005) ⁹⁹	Case register	5	2323	Denmark	Population sample. More suicide risk if history of psychiatric hospital admission.
Erlangsen et al (2006) ¹⁰⁰	Case register	11	229	Denmark	3/1000 hospitalizations over 11 years in >60 age group. Suicide concentrated <7 days after admission or discharge.
Fagg et al (1993) ¹⁰¹	Case-control	7	62	Edinburgh	Parasuicide patients 15-24 who suicided. Multivariate risk factors: alcohol and (or) drug missuse and previous admission.
Fawcett et al (1987) ¹⁰²	Follow-up	4	25/954	United States	Affective disorders. Hopelessness, anhedonia, mood cycling predicted.

Fawcett et al (1990) ¹⁰³	Follow-up	10	32/954	United States	Affective disorders. Panic attacks, psychic anxiety, insomnia, reduced concentration, alcohol abuse, anhedonia <1 year.
Fawcett (1988) ⁸²	Follow-up	9	25/955	United States	Affective disorders. Anhedonia, psychic anxiety, panic attacks, depressive turmoil and alcohol abuse predictors <1 year.
Hansen et al (2003) ¹⁰⁴	Cohort	10	15	Denmark	Affective disorders. Comorbid personality disorder ("Character Deviation") increased risk 3.41.
Hoang et al (2011) ¹⁰⁵	Record linkage	1		England	Follow-up of IPs discharged with schizophrenia or bipolar disorder showed raised SMRs for suicide.
Hoyer et al (2009) ⁸⁹	Case register	1	135	Denmark	33% died during hospitalization. Suicide attempt and job loss history predicted suicide; improvement the opposite.
Kan et al (2007) ¹⁰⁶	Case-control	2	97	Hong Kong	Suicides <60 days postdischarge. Risk with previous admission for self-harm, compulsory admission, living alone.
Kapur et al (2006) ¹⁰⁷	NCI	7	187-156	England	Between 1997-2003 IP suicide rates fell 17% but postdischarge rates rose lightly.
Kapur et al (2013) ²⁶	NCI	12	1942	England	Between 1997-2008 rates fell 31.4% for both sexes but transfer to postdischarge settings is possible.
Large et al (2011) ⁸⁵	Meta-analysis		28 studies	Sydney	DSH. Hopelessness, guilt or inadequacy feelings, depressed mood, suicidal ideation, family history moderate predictors
Links et al (2012) ¹⁰⁸	Cohort	1	4/120	Toronto	Inner-city, high-risk cohort followed 6 months. Recent suicide attempts, living in a shelter, and impulsivity predicted.
Madsen et al (2012) ⁸⁴	Cohort	10	279	Denmark	Time at risk considered. 50% dead <18 days of admission. Recent suicide attempt, being educated, personality disorder.
Nordentoft et al (2011) ¹⁰⁹	Cohort	36	3365	Denmark	Follow-up of national cohorts of suicide in those with and without mental health services contact.

DSH = deliberate self-harm

IP = inpatient

NCI = National Confidential Inquiry

SMR = standardized mortality ratio

eTable 2 Case-controlled retrospective studies

Study (year)	Type	Suicides	Place	Findings
Agerbo et al (2001) ¹¹⁰	Nested case-control	811	Denmark	Higher-income IPs with mental illness more at risk than lower-income patients. Commentary by Gunnell.
Allebeck et al (1987) ¹¹¹	Case register	68	Stockholm	Previous suicide attempts, females living alone, males abusing alcohol.
Appleby et al (1999) ¹¹²	Case register	229	Manchester	Risk high in personality and affective disorders; most during authorized leave; assessed as no suicide risk.
Bickley et al (2013) ¹¹³	Records	100	England	55% of IPs with mental illness died by suicide <1 week postdischarge.
Burgess et al (2000) ¹¹⁴	Case register	629	Victoria, Australia	20% preventable: Poor staff-patient relations, risk incompletely assessed, poor treatment and continuity of care.
Cheng et al (2009) ³⁰	Records	27	Taipei	Jumping, hanging, or drowning. Males oftener. Psychiatric patients warned more often than nonpsychiatric.
Crisanti and Love (1999) ¹¹⁵	Records	49	Calgary	Suicide mortality no higher in involuntarily detained IPs.
Deisenhammer et al (2000) ¹¹⁶	Records	44	Innsbruck	39% while absconded. Most open ward suicides enacted out of hospital.
Deisenhammer et al (2007) ¹¹⁷	Records	665	Innsbruck	28% of inpatient suicides <1 week after discharge.
Dong et al (2005) ¹¹⁸	Records	92	Hong Kong	Majority schizophrenia; depressed, absconding, akathisia, perceived as at low rsik.
Drake and Cotton (1986) ¹¹⁹	Records	15	United States	Schizophrenia IP sample. Persistent depressed mood among suicides, significantly more than control subjects.
Drake et al (1984) ¹²⁰	Records	15	Cambridge, Massachusetts	Schizophrenia only. Educated, insight, depressed, hopeless.
Flood and Seager (1968) ¹²¹	Records	73	Bristol	High frequency of disturbed relations with hospital staff and premature discharge against medical advice.
Gaertner et al (2002) ¹²²	Case-control	61	Germany	Affective disorder most risk. Lithium given less often than controls. IPs with schizophrenia on full-dose tricyclics.
Gale et al (1980) ¹²³	Hospital records	60	New York	5 hospitals compared. Patient acuity, and lower socioeconomic-ethnic status predictive.
Geddes et al (1997) ¹²⁴	Cohort	2311	Scotland	Almost 2-fold suicide risk in first 28 days, compared with rest of the year.

Goldacre et al (1993) ¹²⁵	Case-control	134	Oxford	Very high risk for suicide in first month after discharge from hospital after a psychiatric admission, compared with rest of year.
Haklai et al (2011) ¹²⁶	Record linkage	RR=16.3*	Israel	Age-adjusted suicide risk very high for those ever hospitalized (RR = 16). Noncancer natural causes RR = 113.
Hattori et al (1995) ¹²⁷	Charts	36	Japan	Schizoaffective and depressive disorders frequent. Intrafamilial conflict, loss, and loneliness inculcated.
Heila et al (2005) ¹²⁸	Record linkage	1479	Finland	Schizophrenia. Onset of bed reductions of 1980-96 increased mortality only in early phase patients, not generally.
Ho (2003) ¹²⁹	Record linkage	280	Hong Kong	280/21921 patients (1.3%) died by suicide <1 year after discharge. Of these, 85/280 (30.4%) were <28 days postdischarge.
Ho (2006) ¹³⁰	Record linkage	333	Hong Kong	Contrary to other studies, patients hospitalized for short (<15 day) periods had lower suicide risk after discharge.
Hoffman and Modestin (1987) ¹³¹	Case-control	53	Berne Canton	Previous suicide attempts especially if serious, repeated but not multiple attempts were predictive.
Holley et al (1998) ¹³²	Charts	49	Alberta	First-ever hospitalizations for suicide attempt. Risk higher in older females, males, low-income area, violent method.
Honkonen et al (2008) ¹³³	Charts	94	Finland	Half the deaths were alcohol- or drug-related. Mood disorders and use of coercive measures increased risk.
Hung et al (2000) ¹³⁴	Records	15	Taipei	Medical IPs. Highest fatality rates on neurology and COPD patients. Half incidents <2 weeks and on night shift.
Hunt et al (2007) ¹³⁵	NCI	222	England	Previous attempt history, recent adverse event, active mental illness, comorbidity and absconding were predictive.
Hunt et al (2010) ²⁴	NCI	1851	England	People who died by suicide who absconded. Likely young, unemployed, homeless, schizophrenic, previous violence and substance misuse.
Hunt et al (2013) ¹³⁶	NCI	107	England	IP suicides <1 week. Risk with recent diagnosis, acutely ill, recent adverse life events. 64% died off the ward.
Keller and Wolfersdorf (1995) ¹³⁷	Hospital records	*	Germany	IP suicide rates rose 1970-79 and fell 1980-92 along with change in treatment policies.
Kessing and Munk-Jørgensen (2004) ¹³⁸	Case register	117	Denmark	Adjusting for severity, IP not OP admission predicted higher risk for rehospitalization and suicide.
Kessing (2004) ⁸⁸	Case register	81	Denmark	Severity of depressive illness (ICD-10) is predictive of suicide risk (validating the grading typology).
King et al (2001) ¹³⁹	Case-control	234	Wessex	Higher risk with disruption of continuity of care, job loss, prior self-harm, unplanned discharge, suicidal ideation.

King et al (2001) ¹⁴⁰	Case-control	59	Wessex	Prior DSH, involuntary admission, police involvement, depressed, property violence, absconder, caregiver away.
Kjelsberg et al (1994) ¹⁴¹	Case-control	35	Norway	Adolescents: disruptive, help-rejecting, immature, poor self-esteem, learning difficulties, abusive parents,
Krupinski et al (1998) ¹⁴²	Case-control	33	Munich	Suicidal tendencies on admission and prior attempting best predictors, comprehensive suicide assessments needed.
Krupinski et al (1998) ¹⁴³	Case-control	33	Munich	Suicides were prescribed lithium less frequently than controls and neuroleptics more often.
Kullgren (1988) ¹⁴⁴	Case-control	15	Sweden	Borderline personality disorder. More hospitalizations, suicidal behaviour. Half died when unilaterally discharged.
Kuo et al (2005) ¹⁴⁵	Case-control	78	Taipei	Schizophrenia. Depressive syndrome, higher suicide intensity. Unlike in West, living alone and drugs not factors.
Lawrence et al (1999) ¹⁴⁶	Cohort	471	Western Australia	Risk higher for younger, males, marrieds (contrary to population findings), adjustment reactions, longer stays.
Lee and Lin (2009) ¹⁴⁷	Case-control	87	Taiwan	Schizophrenia. Higher risk shortly after discharge. Lower suicide risk with younger attending psychiatrists.
Li et al (2008) ²⁰	Case-control	64	Guangzhou	Schizophrenic patients with guilty thoughts, depressed mood, suicidal ideation and attempt 1 month pre-admission.
Lin et al (2009) ¹⁴⁸	Case-control	311	Taiwan	Discharged cancer patients, unemployed more at risk <3 months postdischarge.
Luxton et al (2013) ¹⁴⁹	Cohort	153	United States	US Military hospitals. Suicides were 50% of deaths. Frequencies highest within <30-90 days after discharge.
Marusic et al (2002) ¹⁵⁰	Case-control	58	Slovenia	Females>males among IP suicides suggests undiagnosed depression among community males.
McKenzie and Wurr (2001) ¹⁵¹	Case-control	77	Bradford, UK	Early (<3 months) vs late suicide predicted by history of DSH, mood disorder present, longer case (progress) notes.
Modestin and Hoffman (1989) ¹⁵²	Case-control	102	Berne Canton	Compared IP suicides with suicides <1 year postdischarge. Several differences noted in the 2 groups.
Modestin and Kopp (1988) ¹⁵³	Case-control	75	Switzerland	Affective disorder included. Risk higher in males, with prior suicide attempts and more hospital admissions.
Modestin and Schwarzenbach (1992) ¹⁵⁴	Case-control	64	Switzerland	Less neuroleptics and no lithium was prescribed, compared with controls.
Modestin et al (1992) ¹⁵⁵	Case-control	53	Switzerland	Schizophrenia. Suicidality in index admission, vocational difficulties and admission duration predicted 82% of cases.
Morgan and Stanton (1997) ¹⁵⁶	Questionnaires	18	Avon	Compared Avon IP suicides with earlier group. Apparent clinical improvement without stress resolution was misleading.

Myers and Neal (1978) ¹⁵⁷	Records	256	Shropshire	More Eastern Europeans, broken marriages, previous attempts (violent); 63% saw doctor <1 month earlier.
Neuner et al (2011) ¹⁵⁸	Matched case-control	133	Germany	Pharmacotherapy: Other than possible underuse of lithium in affectives no inter-group differences
Perez-Carceles et al (2001) ¹⁵⁹	Case-control	34	Spain	Prison hospital suicides, compared with general population. Schizophrenia in 65%; hanging in 94%.
Pirkis et al (2002) ¹⁶⁰	Matched case-control	597	Australia	Hospital admission <1 year or community contact for registration only (not follow-up) were maximum risk factors.
Pirkola et al (2005) ¹⁶¹	Case-control	1407	Finland	Hospital suicides <1 week postdischarge. More severe psychopathology, poorer functioning, more lethal methods.
Powell et al (2000) ¹⁶²	Case-control	112	England	Suicidality prior to or at admission, recent bereavement, delusions, hopelessness, family history were risks.
Qin and Nordentoft (2005) ¹⁶³	Nested case-control	9316	Denmark	Sharp peaks first week after admission and discharge. Recommend systematic evaluation and treatment at these times.
Qin et al (2009) ¹⁶⁴	Case register	712	Denmark	Paracetamol poisoning predictive of subsequent suicide (Adj IRR = 10.9)
Robin et al (1968) ¹⁶⁵	Records	73	Southend	Suicide during or shortly after treatment.
Rorsman (1973) ¹⁶⁶	Records	46	Lund	Previous attempt in 56%; men bereaved or divorced, females living alone.
Roy and Draper (1995) ¹⁶⁷	Records	37	Brockville, ON	Schizophrenia and involuntary detention preponderant, compared with controls; more living alone
Roy (1982) ¹⁶⁸	Records	15	Toronto	Young, unemployed, alone, depressed. Suicide <1 month postdischarge in 44%.
Shah and Ganesvaran (1997) ¹⁶⁹	Matched case-control	60	Melbourne	Schizophrenia diagnosis, DSH, longer stay, frequent ward transfers, unstable suicidal ideation were risks.
Sharma et al (1998) ⁸¹	Matched case-control	44	London, ON	Majority suffered mood disorders, some with cycling, fluctuating mental state. Suicide risk noted only in 32%.
Stebalj et al (1999) ¹⁷⁰	Matched case-control	79	Ljubljana	Suicides with schizophrenia and affective psychoses, compared with controls. Depressed mood, past suicidal behaviour risks.
Sundqvist-Stensman (1987) ¹⁷¹	Case register	57	Uppsala	Frequent admissions. Hanging on wards; drowning when absconding.
Suominen et al (2002) ¹⁷²	Case-control	26	Finland	General hospital suicides mostly suffer concurrent major depression, calling for early recognition and treatment.
Taiminen and Kujari (1994) ¹⁷³	Case-control	28	Turku	Suicide group had lower neuroleptic doses and more frequent and diazepam medication. Depression frequent.

Taiminen (1993) ¹⁷⁴	Case-control	25	Turku	Schizophrenia or paranoid included. History of suicide attempts. More negative symptoms and depression.
Thong et al (2008) ¹⁷⁵	Matched case-control	123	Singapore	Logistic regression yielded prior potentially lethal suicide attempt, comorbid physical illness and delusions.
Wolfersdorf et al (1997) ¹⁷⁶	Case-control	585	Germany	Hospital rates rose 1970-93 because of shorter stays, rapid and premature discharges of schizophrenic patients.

COPD = chronic obstructive pulmonary disease

DSH = deliberate self-harm

IP = inpatient

NCI = National Confidential Inquiry

OP = outpatient

eTable 3 Uncontrolled descriptive studies

Study (year)	Type	Years	Suicides, N	Place	Findings
Ajdacic-Gross et al (2009) ¹⁷⁷	Case register	13	141	Zürich	Risk high in personality and affective disorders; most during authorized leave; assessed as no suicide risk.
Allebeck et al (1986) ¹⁷⁸	Case register	10	33	Stockholm	Schizophrenic cohort. Younger patients predominate.
Allgulander et al (1992) ¹⁷⁹	Record-linkage	15	1582	Stockholm	Highest risk for affective disorders (3-fold) followed by unspecified psychoses.
Andersen et al (2000) ¹⁸⁰	Record-linkage	4.7	472	Denmark	42% previously hospitalized; 20% recently discharged; 66% recently saw GP.
Bahmanyar et al (2009) ¹⁸¹	Register-linkage	8 & 16.3	820	Sweden	Peptic ulcer patients carry higher suicide risk whether operated on (SMR 1.6) or not (SMR 1.7).
Barner-Rasmussen et al (1986) ¹⁸²	Case register	12	6,564	Denmark	21% while inpatients; 79% <1 year after discharge.
Bassett and Tsourtos (1993) ⁶⁶	Charts	10	6	South Australia	Increased numbers coincidental with greater acuity.
Baxter and Appleby (1999) ¹⁸³	Case Register	18	117	Salford	68% of people who died by suicide had history of hospital admission.
Busch et al (2003) ¹⁸⁴	Records		76	United States	79% SADS agitated; 78% denied suicide ideation before death.
Busch et al (1993) ¹⁸⁵	Charts	7	14	United States	Comorbid psychic anxiety with psychosis and (or) depression.
Copas and Robin (1982) ¹⁸⁶	Records	7	696	United Kingdom	Risks higher in males, highest in first week and fall off thereafter.
Goh et al (1989) ¹⁸⁷	Records	8	57	Birmingham	Violent deaths in both sexes. Patients with chronic illness.
Hintikka and Viinamaki (1998) ¹⁸⁸	Charts	3	5	Finland	5 cases of people who died by suicide <1 day after discharge may have been inadequately assessed, at a time of major bed cuts.
Johansson et al (1996) ¹⁸⁹	Charts	2	59	Stockholm	Foreign-born at 2-fold risk, suggestive of dysacculturation, unemployment, social degradation, rootlessness.

Jones et al (2011) ¹⁹⁰	Case register	28	218	England	Special hospital inpatients. No relation between legal category and suicide. Women particularly at high risk.
King (2001) ¹⁹¹	Coroners	5	236	Wessex	41% of people who died by suicide referred before deaths but only 27% in contact 1 year before, of whom 60% had been IPs.
Martin (2000) ¹⁷	Hospital records	31.5	276	Toronto	22% occurred in hospital and 42% while on passes. 20% <1 week after admission, 52% <1 month.
Meehan et al (2006) ¹⁹²	NCI	4	4859	England	Compared inpatient suicides vs. discharged <3 months. 219 deaths considered preventable.
Mills et al (2008) ¹⁶	Records	6.5	42	United States	VA Root Cause Analyses hospital suicides (42) & attempts (143) reviewed. Hanging, cutting, and overdose in 70%.
Modestin and Wurmle (1989) ¹⁹³	Records	9	115	Switzerland	No contagion or modeling effect observed between suicides.
Morgan and Priest (1991) ¹⁹⁴	Questionnaires	2.5	27	Bristol	Problems with communication with patients on leave or between staff members relevant.
Mortensen and Juel (1993) ¹⁹⁵	Registers	18		Denmark	First episode schizophrenia admissions. Suicide caused 50% deaths in men and 35% in women but RR women>men.
Neuner et al (2008) ¹⁹	BADO	10	41	Regensburg	Pharmacotherapy resistance, prior attempt, severe side effects, supportive psychotherapy pre-admission predictive.
Neuner et al (2010) ¹⁹⁶	BADO	10	37	Germany	Other than 78% IP suicides <50 days postadmission no time patterns. 14/37 (38%) on public holidays.
Nordentoft et al (1993) ¹⁹⁷	Registry linkage	10	103	Copenhagen	>2 prior attempts, older, manic-depressive, living alone, not treated in respirator predictive of higher risk.
Papadopoulos (2008) ¹⁹⁸	Hospital records	5	2	Athens	Of 5836 deaths in a public hospital only 2 were registered as suicide. Probably understated owing to forensic referral.
Proulx et al (1997) ¹⁹⁹	Hospital records	5	100	Montreal	General hospital suicides more predictable than chronic psychiatric patients. Need careful assessing of all suicidal IP.
Ripley (1979) ²⁰⁰	Hospital records	10	14	Seattle	Medical and surgical inpatients not referred to psychiatrist had symptoms of depression and suicidal ideation.

Shapiro and Waltzer (1980) ²⁰¹	Hospital records	15	16	New York	Detailed case descriptions of suicides and serious attempts on medical wards in a general hospital.
Speissl et al (2002) ²⁰²	BADO	10	30	Regensburg	State psychiatric hospital. Suicides primarily diagnosed with schizophrenia, higher cumulative length of stay, prior DSH.
Taiminen and Helenius (1994) ²⁰³	Hospital records	25	59	Turku	No evidence for suicide contagion (temporal clustering).
Taiminen et al (1996) ²⁰⁴	Hospital records	11	7	Turku	Suicide frequency may decrease with staff experience of suicidal people.
Temoche et al (1964) ²⁰⁵	Case register	3	30	Massachusetts	Early postdischarge period (<6 months) most risk.
Tseng et al (2011) ²⁹	Hospital records	10	27	Taiwan	Age-standardized suicide in general hospital 8 times higher than in general public, signalling need for risk alertness.

DSH = deliberate self-harm

GP = general practitioner

IP = inpatient

NCI = National Confidential Inquiry

SADS = Schedule for
Affective Disorders and
Schizophrenia

SMR = standardized
mortality ratio

VA = Veterans Affairs