**Table S1:** Study on seasonal influenza vaccination uptake among health professionals in Italy, 1990-2022.

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| **Reference** | **Study Period** | **Setting** | **Health professional (HP) population under study** | **Type of study, sampling (s.) strategy** | **Measures of vaccine acceptance (VA), attitudes towards seasonal influenza vaccination (SIV)** | **N (Total sample size), Response rate** | **Findings** |
| Albano et al., 2014 | Nov 2009 – Jan 2010  | Eight non-teaching hospitals (Naples and Avellino, Campania) | Physicians, nurses, technicians, ancillary staff | Anonymous survey, random s. | SIV uptake or willingness. Perception of SIV risks and benefits. | 720,83.3% | 16.7% vaccinated; 43.6% of unvaccinated not planning to receive SIV. Mean rated SIV utility 4.3/10. Mean rated SIV dangerousness 5.7/10. 31% fear of adverse effects |
| Alicino et al., 2015 | 2006 – 2014 | Teaching hospital (Genoa, Liguria) | Physicians, nurses, other clinical personnel | Intervention study (vaccine promotion strategies), no s. | SIV uptake | 3444, NA | SIV coverage fluctuating over the years, from 20% at study start to 16% at study end, peaking at 34% in 2009-10 |
| Amodio et al., 2010 | Three flu seasons (2005-6 to 2007-8) | Teaching hospital (Palermo, Sicily) | All personnel (incl. admin. staff w/ patient contact) | Analysis of administrative data, no s. | SIV uptake | ~2600, NA | Mean coverage 11.2%, declining from 14.7% at the start to 8.2% at the end. Higher rate among biologists and physicians vs nurses and other staff, and among males vs females |
| Amodio et al., 2011a | Sep 2010 – Oct 2010 | Teaching hospital (Palermo, Sicily) | Medical residents | Anonymous web-based survey, no s. | SIV uptake in previous season. Intention to vaccinate for current season. Perception of SIV benefits for own and others’ health | 302,66.9% | 21.8% vaccinated previous year. 22.3% planning to vaccinate. Higher OR of intention associated w/ perception of SIV safety, efficacy, and risk for themselves, patients and general population |
| Amodio et al., 2011b | Nov 2009 – Feb 2010 | Teaching hospital (Palermo, Sicily) | All personnel | Analysis of administrative data, no s. | SIV uptake | 2267, NA | 18.7% vaccinated. Higher OR associated w/ male sex, physicians and biologists, SIV in previous season |
| Arghittu et al., 2020 | Nov 2018 – Mar 2019 | Teaching hospital (Sassari, Sardinia) | All personnel | Anonymous web-based survey, no s. | SIV uptake or intention. | 2270, 20.1% | 30.6% coverage, 44.2% willing. Higher OR for physicians, awareness of risk for themselves and some categories; lower OR for working in surgical wards, more contact time w/ patients, difficulties in access |
| Ballada et al., 1994 | Oct 1990 | Eleven local health care centres (5 Italian regions) | Physicians, nurses, pharmacists | Anonymous survey; s. strategy not reported | SIV uptake in previous season and intention for current season. Perception of SIV efficacy and risks | 1129, 99.5% | 18.8% vaccinated previous year (35% pharmacists). 27.3% planning to vaccinate. >90% physicians and pharmacists convinced of SIV efficacy; 24.2% nurses contrary or dubious. Intention mostly related to perception of own risk from disease |
| Barbara et al., 2020 | Starting from the 2015-2016 campaign | Gemelli Policlinic Hospital, Rome | HP | quasi-experimental study | evaluate the efficacy of different strategies implemented during the last four years (2015-2019) | almost 4000 HCWs each year | Increasing SIV from 6% in 2015-2016 to almost 22% at the end of 2018-2019. The overall number of vaccinated HP increased, especially at younger ages. OSV3 strategy led to better results; physicians had higher SIV than nurses and others. |
| Barbadoro et al., 2020 | 2012 – 2013 | Multipurpose study from National Institute of Statistics | All personnel | Face-to-face interviews, census samples | SIV uptake in the past 12 months | 5823, NA | 18.1% vaccinated. Higher OR associated w/ male sex, older age, chronic diseases, and poor self-reported health |
| Bianchi et al., 2021 | 2018-2019 and 2017-2018 flu seasons | 44 out of 50 the Bari Policlinico hospital operative units | HP | Cross-sectional study | For the 2018/2019 influenza season, OSV3 was offered directly in 44 units of the Bari Policlinico hospital (50 units, 3,397 HP). The hospital granted the HP access to the vaccination clinic during October and December 2018. | [SIV in 798 HP - 2018/19 season vs 482 HP - 2017/18 season] | 2018/19 SIV 20.4% (n = 798) > 2017/18 SIV 14.2% (+6.2%). The highest VA among physicians (33.4%), followed by other HP (23.8%), auxiliary staff (8.6%), and nurses (7.2%). 284 HP (36.5%) vaccinated at on-site sessions. Vaccine uptake associated with male gender and working where active vaccination offer in place. OSV3 improved VA by 44% compared to the previous season. |
| Bonaccorsi et al., 2013 | Oct 2010 – Nov 2010 | Empoli and Pistoia LHUs1 and Careggi teaching hospital (Tuscany) | All personnel | Anonymous survey, convenience samples | SIV uptake or willingness. Opinions about SIV | 1996, NA | SIV rate 45.1% among physicians, 15% nurses, 17.7% other HP. Higher OR associated w/ male sex, older age, chronic resp. diseases and diabetes, living w/ a person w/ comorbidities, previous SIV, poor self-reported health. Avoidance related to low perception of risk infection. |
| Bonaccorsi et al., 2015 | Oct 2010 – Apr 2011 | Empoli and Pistoia LHUs1 and Careggi teaching hospital (Tuscany) | All personnel, including nonclinical | Anonymous survey, convenience samples | SIV uptake last 3 years. Opinions about SIV | 11369, 1975 respondents | SIV coverage ~18% during 3 years. Higher VA among males, physicians, chronic diseases, poor self-reported health, at-risk contacts. Self and family protection main drivers of VA; perception of low severity and risks of vaccine main reasons for refusal |
| Brunelli et al., 2021 | Dec 2019 | Seven hospitals (Friuli-Venezia Giulia) | All personnel | Survey of hospital managements, no s. | SIV uptake | 12627, NA | Mean SIV coverage 24.9% (range 17% – 33.3%). Best results in hospitals distributing kits in units for on-site administration. |
| Campagna et al., 2016 | Mar 2013 | Thirty hospitals (Sardinia) | All personnel | Survey of hospital managements, no s. | SIV uptake | 12977; SIV data from 23 hospitals | 20 out of 23 hospitals reported SIV coverage <16%, 9 of which reported less than 6%. |
| Castella et al., 2009 | Oct 2007 | Rivoli hospital (Piedmont) | All personnel | Anonymous survey, no s. | SIV uptake previous 2 years. Reasons for adherence or refusal. | 773, 43.6% | 25.8% coverage, higher for physicians (> 50%) than other HP (~20%). Self-protection main reason of VA; refusal mostly motivated by low belief in SIV efficacy. |
| Chittano Congedo et al., 2021 | 2016-2019 | A northern Italian university | Third-year healthcare students  | Cross-sectional study, anonymous online self-administered questionnaire | SIV uptake in three campaigns. Reasons for adherence or refusal. | 352 / 392, 90% | Self-protection as main reason for adherence (87.5%), perception of influenza as non-threatening (24.4%) as main reason for refusal. Statistically significant associations with adherence to 2018-2019 campaign: being a nursing/midwifery student and agreeing or being undecided about mandating vaccination in health facilities. Low vaccine uptake, but good knowledge of the flu-driven risks. |
| Costantino et al., 2012a | Jan 2011 | GP2 training course of West Sicily | GP2 trainees | Anonymous survey, no s. | SIV uptake last five years. Reasons for adherence. | 105, 76.2% | Coverage 26.2% previous year, 18.7% current year. Higher OR for perception of high infection risk. |
| Costantino et al., 2012b | Sep 2010 – Oct 2010 | Four post-graduate schools of Hygiene and Preventive Medicine (Sicily & Calabria) | Medical residents | Anonymous survey, no s. | SIV uptake previous five years. Reasons for adherence or refusal. | 73, 94.5% | Coverage 20.3% previous year, 27.5% current year. Compliance motivated with desire to not spread infection to others; refusal mainly due to low perception of risk from disease. |
| Costantino et al., 2014 | Apr 2012 – Jun 2012 | Eighteen Italian post-graduate schools | Medical residents | Anonymous web-based survey, no s. | SIV uptake last 3 years. Reasons for adherence or refusal. | 10396, 24.1% | Coverage declining with time from 21.7% to 11.9%. VA mostly for protection of themselves and others; refusal mainly motivated with low risk perception |
| Cozza et al., 2015 | Dec 2013 | Teaching hospital (Rome, Lazio) | All personnel | Anonymous survey, cluster (units) s. | Compliance to annual SIV. Reasons for adherence or refusal. | 191, 90.8% | 6.8% compliance to annual SIV. Patient protection main reason for VA; low risk perception main driver for refusal; missed revaccination motivated by low SIV efficacy (after 2009 pandemic). Higher OR for physicians, greater seniority |
| Desiante et al., 2017 | February-March 2016 | GPs2 of Taranto | GPs2 | Cross-sectional study | SIV among GPs2 and factors influencing their adherence to the vaccinations. Tool: self-administered web-based standardized questionnaire. | 229/471 (48.6%)[229(M 21%/F 79%)] | SIV 2015/2016: 76.4% (175/229). >=900 patients increased the SIV likelihood. 79.9% of GPs2 prefer to use the adjuvated vaccines on patients aged >64. Motivational factors pro-vaccination: 53.1 % (93/175) their own health protection; 45.1% (79/175) to protect the health of their own patients; 25.4% (62/175) to protect their family and friends. GPs2 without SIV: 58% (30/51) influenza as non-dangerous pathology; 5.9% (3/51) vaccine could be risky; 35.3% to avoid reactions. |
| Durando et al., 2016 | Oct 2013 – Feb 2014 | Teaching hospital and LHU1 (Genoa, Liguria) | All personnel | Anonymous survey, no s. | SIV uptake last 6 years. Reasons for adherence or refusal. | 8248, 10.1% | Annual coverage 25.6-31.4%. 12.5% compliance through whole period. Protection of themselves and family main reason for VA. Higher OR for physicians, belief in importance in annual SIV, trust in SIV safety; lower OR for mistrust in pharma companies |
| Festini et al., 2007 | 2005-6 flu season | Paediatric hospital (Florence, Tuscany) | Nurses | Intervention study and anonymous survey, no s. | SIV uptake after active no-cost offer. Reasons for adherence or refusal. | 327, unknown | 30.3% coverage. Patient protection (62%) main driver, followed by self and family protection, and gratuity. Perceived futility of SIV main reason for refusal.  |
| Fortunato et al., 2015 | Nov 2009 – Mar 2011 | Fifty-one hospitals (Apulia, Italy) | All personnel | Anonymous survey, no s. | SIV uptake | 2198 respondents (total unknown) | 24.8% coverage. Highest OR for females, physicians, being offered SIV from GP2 or occupational health physician |
| Gallone et al. 2017 | Apr 2014 | University of Bari, Italy | Students attending medical and paramedical degree courses | Case-control study | Determinants of vaccination compliance. Tool: online anonymous questionnaire administered. | NR [669 (M 46% / F 54%)] | SIV associated with: 1. being invited from the University; 2. opinion that vaccine is safe and useful; 3. specific training about influenza vaccination during the course; 4. considering themselves as at a major risk of flu-related complication.  |
| Gianino, M.M et al., 2021 | 2017-2018 and 2010-2013 flu seasons | A large Teaching Hospital (Molinette) selected from *Azienda Ospedaliera Universitaria “Città della salute e della Scienza,”* a complex of four interconnected hospitals. | HP | Datasets from hospital registers, national and regional reports, subsequently merged and analysed. | Excess absenteeism during 2017-2018 severe influenza season, compared with 2010-2013 moderate flu seasons | 5287 (approximately 45% of the all employees) [M 26.3% / F 73.7%] | Increased absenteeism among HP during the epidemic period of severe season (weeks 42-17) in comparison with non-epidemic periods (weeks 18-41), the absolute increase correlated with a relative increase of 70% (from 4.05 to 6.68 days/person). Less excess of absenteeism in vaccinated HP vs. non-vaccinated (1.74 vs 2.71 days/person). |
| Karnaki et al., 2019 | October 2012 - April 2014 | HP in Europe (14 EU countries), Data from Italy (n=251). | HP | 14 European countries, including Greece, Italy and Romania | To explore HP attitudes and behaviours towards vaccination for a number of VPDs. Tool: online anonymous questionnaire. | 5424/5553 (97.7%)[5424 (M 19.1 / F 80.9%)] | HP considered influenza (86.4%) as highest risk disease for occupational exposure in the workplace. 43.8% without SIV in the last 10 years, 65.6% not vaccinated against pandemic influenza in 2009. HP from Italy and Slovenia had the highest probabilities of not believing in vaccinations in relation to those from Sweden. The main barriers for SIV: belief of challenging natural immunity by contracting the disease (19.5%), side effect concerns (14.5%). |
| Keske et al. 2021 | May - July 2019 | Infection control team (ICT). A collaborative survey by European Committee of infection Control (EUCIC) members. | Italy one out of 56 respondent countries. ICT members (physicians, nurses) as main SIV motivators among HP. | Cross-sectional study | To examine the opinion of ICT member about SIV and related factors affecting their perceptions. Tool: self-administered online survey. | NR [899(M 32%/F 68%)] | SIV 100% among ICT in Finland, Portugal, Norway, Israel, vs lowest rates in Italy (68%) and Turkey (39%). Most significant factors for ICT members' SIV: 1. personal influenza vaccine experience (49%); 2. scientific authorities (48%); 3. being members of ICT. |
| Lorini et al., 2020a | Sep 2018 – Oct 2018 | Twenty-eight nursing homes (Tuscany) | Nurses, physiotherapists, aides, educators, nonclinical staff | Anonymous survey, no s. | SIV uptake previous 2 years and intention current year. Standardized measures of health literacy and vaccine confidence | 710 respondents (total unknown) | 16% past uptake, 28.4% planned. Significant association w/ vaccine confidence, living w/ elderly people, chronic diseases; no association w/ health literacy. |
| Lorini et al., 2020b | A. Nov 2019 – Dec 2019B. Summer 2020 | A. Eight nursing homesB. 111 nursing homes, including the 8 from A (Tuscany) | Not specified | Anonymous survey, no s.A. Intervention study (nudge)B. Cross-sectional study (intervention vs control) | A. SIV intention. Qualitative analysis of reasons.B. SIV uptake previous 2 years and intention current year.Standardized measure of vaccine confidence | A. 527, 40.2%B. 2135, 47.8% | A. 51.8% planning to receive SIV. Risk perception for themselves and contacts as main reason for VA (83%) and refusal (55%).B. Similar coverage before intervention (22-23%); higher uptake (28% vs 20%), intention (38% vs 31%) and vaccine confidence in intervention group |
| Maffeo et al., 2020 | Nov 2019 – Dec 2019 | Teaching hospital (Milan, Lombardy) | All personnel, including administrative staff | Analysis of administrative data + anonymous survey of refusals | SIV uptake. | 3405, NA | 21.5% coverage, increased from previous year after introduction of on-site offer. Refusal associated w/ nurses, female sex, young age, low perception of disease severity, concern for vaccine risks, disbelief in vaccine efficacy |
| Mellucci et al., 2020 | Apr 2019 – Jun 2019 | Teaching hospital (Rome, Lazio) | Nurses and midwives | Anonymous web-based survey, convenience sample | SIV uptake last 3 years and intention next year. Opinions and reasons about SIV | 66, 92.4% | 31-57% coverage last 3 years, 84% intention. Higher VA and better opinions about SIV in HP involved in seasonal vaccination campaign. |
| Napolitano et al., 2019 | Sep 2018 – Nov 2018 | Eight random-selected hospitals in Campania and Calabria | All personnel from critical care units | Anonymous survey, random s. | SIV uptake. Perceived risks and benefits | 967, 54.9% | 35.8% coverage. Higher rate for physicians. Perceived low risk of infection main reason for refusal. |
| Ogliastro et al., 2022 | 2019-2020, 2020-2021 and 2021-2022 flu seasons | IRCCS Ospedale Policlinico San Martino, Genoa | HP | Retrospective, single-center study | SIV coverage rates in the 2019-2020, 2020-2021 and 2021-2022 seasons | 6194 (M 2120 / F 4074) | SIV coverage was below the recommended target in all seasons, with a sharp increase was observed in 2020/2021 (40.9%), from 12.8% in 2019/2020 and 23% in 2021/2022. In 2019/2020 and 2021/2022 seasons, physicians were higher vaccinated. |
| Paoli et al., 2019 | Jun 2018 – Aug 2018 | Pediatric university hospital, selected units (Florence, Tuscany) | Physicians, nurses, assistants, technicians | Anonymous survey, no s. | SIV uptake last year. Reasons for adherence of refusal | 31% resp. rate (108 respondents) | ~20% coverage. Patient protection as main reason for VA; refusal mostly motivated with perceived low risk of disease |
| Perrone et al., 2021 | Nov 2020 – Dec 2020 | Teaching hospital (Milan, Lombardy) | All personnel, incl. administrative staff | Analysis of administrative data + anonymous survey of recipients, no s. | SIV uptake. Reasons for adherence | Unreported | 43.1% coverage (21.5% 2019). Importance of vaccines for prevention and patient protection as main reasons for VA. |
| Rabensteiner et al., 2018 | Oct 2016 – Dec 2016 | South Tyrolean Health Service | All personnel, incl. administrative staff | Anonymous web-based survey, no s. | SIV uptake last 4 years. Reasons for adherence of refusal | 9633, 42.4% | 10.4% coverage. Higher OR for males, physicians, unhealthy lifestyle factors. Perceived low risk of disease as main driver of refusal. |
| Riccò et al., 2017 | 2015 | Autonomous province of Trento | Occupational physicians | Anonymous survey, convenience sample | SIV uptake previous year. Perception of infection risks, severity and vaccine risks, reasons for refusal | 105, 87.6% | 46.7% coverage. Lack of time and belief in immunity from previous vaccinations as main reasons for refusal. Higher OR for belief in vaccine efficacy. |
| Santangelo et al., 2021 | May 2019 | Palermo University | Nursing students  | Cross-sectional study | To ascern the determinants of vaccination uptake. Tool: anonymous paper questionnaire. | 403/409 (98.5%)(M 35%/F 65%) | SIV 2019: 21%; intention to vaccinate in next season: 46.6%. Students with a perceived medium-high state of health more likely to vaccinate in the next vaccination campaign. Low risk perception of infection (35.5%); infection not a risk for family/friends (9%); infection not a risk for patients (3%). Forgetting to be vaccinated (16.4%). Concerns about efficacy (10%). Lack of recommendation by the facility (26%). |
| Squeri et al., 2019 | March - June 2018 | University hospital "G. Martino" of Messina | HP | Cross-sectional study | Self-completion questionnaire based on Attachment 3 of Ministerial Circular 25233 of 18 August 2017 | 822 health care workers (324 males and 498 females with an age of 49.5 ± 10.5 SD) | Higher vaccination coverages were found for females, physicians and the clinical area and - for influenza vaccination - in the older age groups. |
| Tognetto et al., 2019 | 2017-8 flu season | Four teaching hospitals (Rome, Lazio) | All personnel | Multicentric intervention study; analysis of administrative data | SIV uptake. | 12226, NA | 4.23% - 12.97% coverage. Higher rates in hospitals conducting multiple actions in education, promotion and access. |
| Tomboloni et al., 2019 | 2015 | Pediatric hospital (Florence, Tuscany) | Nurses (inc. students), pediatricians, technicians, radiologists, pharmacists | Anonymous survey, recruiting strategy not reported | SIV uptake previous 5 years. | 860, 20% | 68.3% never vaccinated in the last 5yy. Lower rates among nurses. |
| Vimercati et al, 2019 | October 2016- January 2018 | Bari Policlinic Hospital, Italy | HP | Cross-sectional study | OSV3 strategy outcome in 2017/2018 compared to SIV among HP in the ad hoc clinic-based previous season.  | NR295 (M 49.5% F 50.5)482 (M 49.2%/ F 50.8%) | Vaccination coverage in the 2016/17 influenza season: 8.7%. Vaccination coverage in the 2017/18 season: 14.2%.OSV3 led to an increase of vaccinated HP compared to the classical vaccination clinic approach. |

1 LHU(s): Local Health Unit(s); 2 GP(s): General Practitioner(s); 3 OSV: On-Site Vaccination.

**References Table S1:** Study on influenza vaccination uptake among health professionals in Italy, 1990-2022.

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