

# STOPPING OVERDOSE

PEER-BASED  
DISTRIBUTION  
OF NALOXONE



# Stopping Overdose: Peer-based distribution of naloxone

**While much attention has focused on risks of HIV transmission, overdose is a major and often overlooked cause of death among people who inject heroin or other opioids.<sup>1</sup> Yet there is a safe and effective treatment: the medication naloxone.**

Used in emergency settings for decades, naloxone reverses opioid overdoses without any side effects beyond opioid withdrawal. The medication has no abuse potential, costs as little as one dollar for a lifesaving dose and can be administered with brief and basic training. In countries as varied as China, Tajikistan, and the United States, programs have trained drug users, their families and friends to efficiently identify the signs of overdose, administer naloxone, and often, save lives. These efforts have reversed thousands of overdoses across the globe, and underscore that drug users and their communities can take positive steps to protect their health.

# Overdose is a widespread risk for drug users

Although statistics in many countries are incomplete, overdose is often the leading cause of death for those who use drugs.<sup>2</sup> This is the case in the United States, where overdose is the most frequent cause of mortality among injection drug users (IDUs)<sup>3</sup> and the second leading cause of accidental injury death overall.<sup>4</sup> In the European Union, overdose is the top reason for preventable death associated with drug use, and there has been the equivalent of a fatal overdose an hour for the past two decades.<sup>5</sup> While data are more limited in transitional and developing countries, people who inject drugs confirm that they frequently witness overdoses or themselves have experienced a non-fatal overdose. Consider:

- **A SIZABLE PROPORTION OF PEOPLE WITH HIV IN RUSSIA**—nearly 21% — die from overdose.<sup>6</sup> Statistics are not as good for people without HIV, but research indicates that overdose is a common occurrence for drug users. In a study among 60 drug users in St. Petersburg, three-quarters had overdosed and nearly all had witnessed an overdose.<sup>7</sup> In another Russian study, 59% had themselves experienced an overdose, and 81% reported they had seen someone else overdose.<sup>8</sup>
- **IN BANGKOK, THAILAND, 30% OF IDUS INTERVIEWED** had suffered an overdose, and more than two-thirds had witnessed one.<sup>9</sup>
- **IN NORTHERN VIETNAM, 43.5% OF RESPONDENTS** had survived an overdose;<sup>10</sup> in another study among male IDUs, 27% of deaths in the sample were attributed to drug overdose.<sup>11</sup>
- **IN CHINA, ONE-THIRD OF RESPONDENTS** in the city of Ningbo reported having accidentally overdosed in the past, and 39% said they'd known someone who'd died of an overdose.<sup>12</sup> In the city of Gejiu, 90% of drug users had witnessed an overdose,<sup>13</sup> and 73.1% of drug users interviewed in Kunming had personally seen someone die from a heroin overdose.<sup>14</sup>

While frequently omitted from the list of HIV prevention interventions targeted to people who inject drugs, overdose prevention and response is a necessary component of HIV/AIDS programming among people who use drugs.<sup>15</sup> HIV infection increases risk of fatal overdose, and overdose can exacerbate HIV-related disease. Additionally, overdose programming is an opportunity to involve clients in other HIV interventions. International HIV/AIDS initiatives including the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) and the Global Fund to Fight AIDS, Tuberculosis and Malaria have issued guidance affirming that they will support overdose prevention programming, including naloxone programs.<sup>16,17</sup> Drug user groups, harm reduction organizations, and AIDS service organizations have an opportunity to start these initiatives in their own communities.

“In my office I try to improve health and save lives but I have found that I can accomplish so much more by putting simple tools like naloxone and clean syringes in the hands of those on the front lines of drug use—and that requires going out into the community. Both my experience and the medical literature demonstrate the altruism and competence of laypeople.”

Dr. Sharon Stancliff  
NEW YORK CITY

# Naloxone – the opioid overdose antidote

“Naloxone is really a valuable thing for injecting drug users. I’ve injected naloxone and saved my friends from a certain death.”

Professional injector trained by Médecins du Monde  
KABUL, AFGHANISTAN

**Naloxone is an easy-to-use, lifesaving antidote to overdose from heroin or prescription opioids.**<sup>18</sup> A safe medicine with no abuse potential, naloxone is an opioid antagonist, which means it ejects heroin and other opioids from receptors in the brain, thereby reversing the respiratory depression caused by an overdose of these drugs.

Naloxone is best administered in the field intramuscularly (with a syringe) or intranasally (spraying with an atomizer up the nose). Naloxone can also be injected intravenously, or even subcutaneously. The medication works within two to eight minutes to restore breathing, returning the victim to consciousness. Naloxone has been used for decades in emergency medical settings, and it is included in the WHO List of Essential Medications.<sup>19</sup> Side effects beyond opioid withdrawal are rare.

Overdose victims may die or suffer brain damage due to a lack of oxygen. Other overdose-related morbidity can include pulmonary conditions and cardiac complications.<sup>20</sup> Drug users or others at the scene of an overdose are often reluctant to call for emergency assistance, fearing that police will accompany the ambulance. Even when this is not the case, there are many barriers to timely first aid. Rescue breathing can be difficult to sustain for the long period required until medical professionals arrive. Emergency personnel may not respond if the location is known as a place where people use drugs. In other situations, ambulances expect payment, are simply not available, or cannot quickly reach locations that are remote or inaccessible.<sup>21</sup>

Some drug users, methadone patients, and their family members are now being trained as overdose responders themselves, and in this capacity, carry naloxone or give the medicine to a friend or family member to use in case of emergency. In some countries, only doctors may prescribe naloxone. In others, pharmacists or others operating under a doctor’s standing order can provide the medication. In a handful of countries, naloxone is available over-the-counter at pharmacies. In the United States, more than 150 programs distribute naloxone, and have recorded more than 10,000 overdose reversals.<sup>22</sup> These initiatives operate in diverse settings: harm reduction organizations, needle-exchange vans, methadone clinics, doctors’ offices, drug-treatment clinics, or with organizations serving those recently released from prison.

# Training first responders

**Provision of naloxone to laypeople began in the mid-1990s in Italy and the United States.** In 1996, after one of the organization's founders died of a heroin overdose, the Chicago Recovery Alliance began to distribute naloxone and train participants on how to reduce risk of overdose, recognize an overdose, perform rescue breathing, administer naloxone and provide after-care. After this training, participants are prescribed naloxone and given several doses to carry. To date, Chicago Recovery Alliance has recorded more than 2,000 overdose reversals.

In the U.S., naloxone programs fall within the scope of normal medical practice and no specialized legislation is required for them to operate. More generally, where the law doesn't expressly address naloxone, the most successful programs tend to be the ones that move forward under the existing legal framework, amass evidence, and then advocate with authorities for additional monetary or political support. Advocacy has included specific legislation to reduce physicians' fear of liability, protect bystanders from prosecution, and provide comprehensive government funding.

In Europe, naloxone pilots were launched in the Channel Islands and in Berlin in the late 1990s.<sup>23</sup> Inspired by these and the Chicago model, efforts to train drug users as overdose responders and supply them with naloxone are now up and running in Russia, Ukraine, Georgia, Kazakhstan, Tajikistan, Afghanistan, China, Vietnam, Thailand, Canada, the United Kingdom, and other European countries. Guidance and rationales for doctors wishing to prescribe naloxone to drug users has been published.<sup>24</sup>

## **NALOXONE IS A TOOL DRUG USERS AND THEIR FAMILIES WANT**

Studies demonstrate drug users want to help their peers who are overdosing.<sup>25, 26, 27</sup> In surveys to determine the appropriateness of take-home naloxone, high proportions of drug users indicate a desire to participate.<sup>28, 29, 30</sup> In addition, in a survey of "carers"—family members of drug users—88% were interested in training on overdose management—especially emergency administration of naloxone.<sup>31</sup> Where drug users are trained as naloxone responders, many find it empowering—a way to save their own life as well as their peers. Syringe access programs and others working with injection drug users report that naloxone distribution often revitalizes outreach, strengthening the alliance between service providers and clients.

*"If I'd had this training a year ago, I think my daughter might be alive today."*

Participant at Prevention Point training at the Allegheny County jail  
PENNSYLVANIA, U.S.

# Training on naloxone administration is effective

“ Before I’d prefer to escape from the scene of the overdose and leave the person to die rather than worry about the police finding me. But now even if I don’t have naloxone with me, I’m sure the ambulance will come anyway and help, because now I know how to talk to them and what to say.”

An overdose responder trained by Tomsk Anti-AIDS  
TOMSK, RUSSIA

**Skeptics often express doubt that drug users will be able to correctly identify an overdose in order to respond.** Research, however, shows the opposite—that drug users, when trained, are as skilled as medical experts in recognizing an overdose and understanding when naloxone is indicated for use.<sup>32</sup> Upon training, drug users showed improved knowledge and confidence about responding to an overdose,<sup>33, 34, 35</sup> and drug users who were trained frequently went on to train their own family and friends.<sup>36</sup> Evidence is also emerging that programs to train laypeople and provide them with naloxone are resulting in successful overdose reversals. Programs in China, Tajikistan, Vietnam, and Russia have documented multiple reversals and declines in overdose-related fatalities following introduction of the naloxone efforts. A project in Afghanistan has focused on training “professional injectors”—that is, skilled injectors whom other drug users hire to inject them. These individuals, too, have succeeded in reversing dozens of overdoses using naloxone.<sup>37</sup>

Several U.S. initiatives have conducted more formal evaluations to determine whether those trained used naloxone, and if so, to assess results.

- **IN ONE SAN FRANCISCO STUDY, 24 PARTICIPANTS** interviewed six months after initial training reported successful resuscitations in 20 heroin overdoses, and there was no evidence of increased drug use or heroin overdose in study participants—in fact heroin use decreased among the sample.<sup>38</sup>
- **IN LOS ANGELES, A SURVEY OF 66 PEOPLE**, most of whom were homeless, found that after being trained on how to respond to overdoses, a significant number reported having used the techniques three months later. Notably, the largest group of overdose victims aided were strangers (40%), demonstrating that drug users will respond to help others, even when the person suffering an overdose is not someone they know.<sup>39</sup>
- **AN EVALUATION OF BALTIMORE’S STAYING ALIVE PROGRAM** showed that training effectively increased naloxone use during opiate overdoses, resulting in 22 reversals by 19 individuals within six months of the training. The program was also found to be effective in training participants on correct overdose response skills not involving naloxone.<sup>40</sup>

# Naloxone distribution and reduced mortality

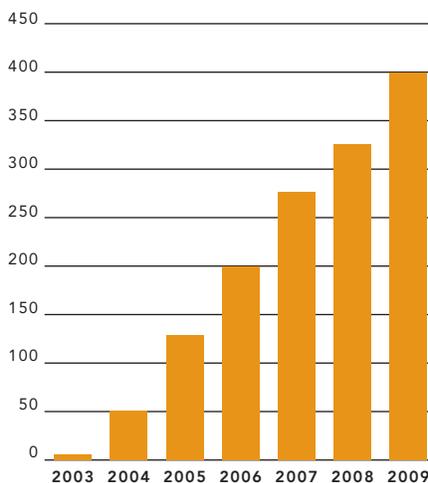
While effects of naloxone on overdose mortality are difficult to measure conclusively given multiple relevant factors—including purity of heroin, methadone availability, and incarceration patterns—the correlation between naloxone availability and decreases in overdose is striking:

- **IN COOK COUNTY, ILLINOIS**, where the Chicago Recovery Alliance operates, there had been a four-fold increase in overdose deaths in the four years before the program began. After the organization began distributing naloxone, the trend reversed, with a 20% decrease in 2001 and 10% decreases over the next two years.<sup>41</sup>
- **IN SAN FRANCISCO, OVERDOSE RATES DECLINED** following initiation of the peer-based naloxone program, even as they rose by 42% in the rest of the state.<sup>42</sup> The cumulative number of instances where naloxone was administered and reported to the DOPE Project (the overdose response program there) has risen steadily since 2004 (Figure 1, next page), with an average of 80 instances reported annually.<sup>43</sup> In an evaluation of the project, which began in late 2003, participants reported successful outcomes in 89% of the 399 cases where naloxone was used, and less than 1% of participants reported serious adverse consequences.<sup>44</sup>
- **THE NEW YORK CITY DEPARTMENT OF HEALTH** and Mental Hygiene acknowledged in 2010 that the city's 27% reduction in drug-related fatalities "may relate in part to community-based initiatives, established by law in 2006, to distribute naloxone within high-risk populations."<sup>45</sup>
- **IN MASSACHUSETTS AND NEW MEXICO**, the government supports distribution of an intranasal formulation of naloxone to drug users. In a Boston, Massachusetts study, among 57 participants who reported witnessing overdose, 50 administered naloxone once or more, resulting in 74 successful reversals.<sup>46</sup> The naloxone pilot program in Massachusetts trains parents, service providers, police, and firefighters, in addition to people who use drugs.<sup>47</sup> Recently, the state health department announced a decrease in overdose deaths, and acknowledged the importance of the naloxone programs.<sup>48</sup>
- **FIGURE 2 (NEXT PAGE) SHOWS THE DECREASE** in overdose deaths in one Russian city, since a naloxone program began there in 2008.<sup>49</sup>

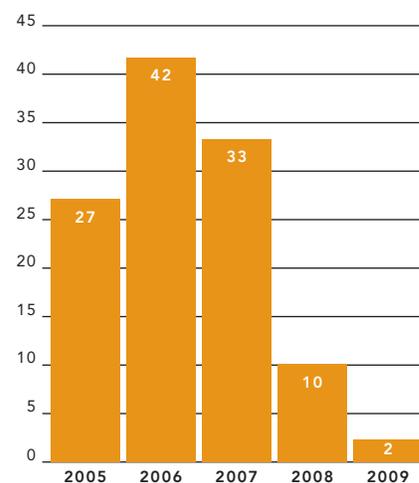
" Before I cared about nothing.... I thought being a drug addict and having HIV meant my life was worth nothing. But after I was saved [with naloxone], I felt like I was reborn, and I realize how precious life is."

An overdose survivor  
HANOI, VIETNAM

**FIGURE 1**  
*Cumulative number of opioid overdose responses with naloxone reported by DOPE Project (San Francisco, U.S.) participants receiving refills by year, 2003-2009*



**FIGURE 2**  
*Reductions in overdose deaths among registered drug users – Naberezhnye Chelny, Russia*



In the U.S., more than 53,000 people have been trained as overdose responders, resulting in more than 10,000 overdose reversals.<sup>50</sup> Other countries have shown progress, too: In Russia, where programs began in 2008 and have operated in 10 sites, 134 reversals were reported in one year.<sup>51</sup> In Vietnam, where informal programs have been underway for eight months, there have already been 19 overdoses reversed.<sup>52</sup> In China, where currently more than a dozen local NGOs have implemented overdose education and response programs, there have been over 100 documented reversals, a majority of them occurring in the past year.<sup>53, 54</sup> In the first year of a pilot project in Almaty, Kazakhstan, 137 naloxone kits were given to drug users, and there were 31 reports of drug users, or their partner, family, friends, or peers using naloxone to reverse an overdose.<sup>55</sup>

# Naloxone as a bridge to other services and increased self-efficacy

**Naloxone's benefit to drug users and their communities includes more than overdose reversal.** Drug users report that saving the life of a friend—or a stranger—can change the way drug users view themselves and their peers, increasing feelings of empowerment and self-efficacy. A study of the Staying Alive program in Baltimore found that post-training, 62% of participants felt that other drug users in their community had greater respect for them because they had been trained to help during an overdose. Nearly three quarters said that they felt responsible for helping other drug users experiencing overdose, and that it was important to teach their peers about preventing overdose in the first place.<sup>56</sup> Another study suggested that teaching peers about naloxone provided drug users with an opportunity to discuss other overdose prevention information with their friends, something that otherwise was difficult to talk about.<sup>57</sup>

Good programs endeavor to provide a continuum of care to their clients, referring them to support groups, legal aid services, or drug treatment programs if they are interested. Some research indicates that overdose response programming can serve as a bridge to drug treatment. A San Francisco study found an increased rate of entry into drug treatment after overdose training; the authors hypothesize that this may be due to improved self-efficacy and increased knowledge gained during the training.<sup>58</sup> In a study that looked at treatment enrollment following an overdose, about half of those who had a conversation with someone about drug treatment after their overdose went on to enroll in a treatment program.<sup>59</sup>

Organizations are also finding that naloxone trainees recruit new participants, or create “intraventions” where drug users help others without the intermediary of an organization. One Baltimore study gives the example of a young man who learned about overdose response from a friend who participated in the program. After successfully reviving an overdose victim himself, he participated in the formal training and then shared his knowledge with his housemates.<sup>60</sup> Or, as one participant in the Chicago Recovery Alliance program put it, “People who overdosed used to be past tense—I knew a guy who overdosed. Now we can talk about them in the present: I know a guy who overdosed and he’s OK now.”<sup>61</sup>

“I regained consciousness and felt like an ordinary person, except that I was a bit disoriented. After a little while, I felt completely restored. It really does bring your life back from the very edge; this injectable naloxone is a great thing!”

Participant at China's Yunnan Daytop Drug Abuse Treatment and Rehabilitation Center  
YUNNAN, CHINA

# Endnotes

- 1 Coffin, P., Sherman, S., Curtis, M. (2010). "Underestimated and overlooked: A global overview of drug overdose and overdose prevention." *Global State of Harm Reduction*. London: International Harm Reduction Association.
- 2 Eurasian Harm Reduction Network. (2008). *Overdose: A Major Cause of Preventable Death in Central and Eastern Europe and Central Asia*. Vilnius EHRN.
- 3 Sherman, S.G., Cheng, Y., Kral, A.H. (2007). Prevalence and correlates of opiate overdose among young injection drug users in a large U.S. city. *Drug and Alcohol Dependence*; 88:182-187.
- 4 Centers for Disease Control and Prevention. (2010). *Poisoning in the United States: Fact Sheet*. Available online at <http://www.cdc.gov/HomeandRecreationalSafety/Poisoning/poisoning-factsheet.htm>.
- 5 European Monitoring Center for Drugs and Drug Addiction. (2010). *Annual report 2010: The state of the drugs problem in Europe*. Luxembourg: Publications Office of the European Union.
- 6 Yermak T.N., Kravchenko A.V., Shakhgildyan V.I., Ladnaya N.N. (2009). "Causes of death among people living with HIV in Russia." Presentation at the All-Russian Congress on Infectious Disease; Moscow, Russian Federation, 30 March - 1 April.
- 7 Grau, L.E., Green, T.C., Torban, M., Blinnikova, K., Krupitsky, E., Ilyuk, R., et al. (2009). Psychosocial and contextual correlates of opioid overdose risk among drug users in St. Petersburg, Russia. *Harm Reduction Journal*; Jul 24;6:17.
- 8 Sergeev B., Karpets, A., Sarang, A., Tikhonov, M. (2003). Prevalence and circumstances of opiate overdose among injection drug users in the Russian Federation. *Journal of Urban Health*; 80(2):212-9.
- 9 Milloy, M.J., Fairbairn, N., Hayashi, K., Suwannawong, P., Kaplan, K., Wood, E., et al (2010). Overdose experiences among injection drug users in Bangkok, Thailand. *Harm Reduction Journal* 13;7:9.
- 10 Bergenstrom, A., Quan, V.M., Nam, L.V., McClausland, K., Thuoc, N.P., Celentano, D., et al. (2008). A cross-sectional study on prevalence of non-fatal drug overdose and associated risk characteristics among out-of-treatment injecting drug users in North Vietnam. *Substance Use and Misuse*; 43:73-84.
- 11 Quan, V.M., Minh, N.L., Ha, T.V., Nguyen, P.N., Vu, P.H, Celentano, D.D., et al. (2010). Mortality and HIV transmission among male Vietnamese injection drug users. *Addiction*. doi:10.1111/j.1360-0443.2010.03175.x.
- 12 Liu, Y., Bartlett, N.A., Li, L.H., Lü, X.Y., Zhou, W.H. (2010). Attitudes and knowledge about naloxone and overdose prevention among Chinese detained drug users. Submitted to the *Journal of Urban Health* August 2010.
- 13 Ibid.
- 14 Personal communication with Daytop, China. (2009). Notes on file with the Open Society Public Health Program.
- 15 Curtis, M., Dasgupta, N. (2010). *Why Overdose Matters for HIV*. New York: Open Society Public Health Program. Available online at [http://www.soros.org/initiatives/health/focus/ihrd/articles\\_publications\\_publications/why-overdose-matters-20100715](http://www.soros.org/initiatives/health/focus/ihrd/articles_publications_publications/why-overdose-matters-20100715).
- 16 PEPFAR. (2010). *Comprehensive HIV Prevention for People Who Inject Drugs, Revised Guidance*. Washington, DC. Online at: [www.pepfar.gov/documents/organization/144970.pdf](http://www.pepfar.gov/documents/organization/144970.pdf).
- 17 Global Fund to Fight AIDS, Tuberculosis and Malaria. (2010). *Harm Reduction Information Note*. Geneva. Online at: [http://www.theglobalfund.org/documents/rounds/10/R10\\_InfoNote\\_HarmReduction\\_en.pdf](http://www.theglobalfund.org/documents/rounds/10/R10_InfoNote_HarmReduction_en.pdf).
- 18 Unfortunately, there is not a simple antidote to stimulant overdose, but information about responding to stimulant overdose can be found at [http://www.soros.org/initiatives/health/focus/ihrd/articles\\_publications\\_publications/overdose\\_20090604](http://www.soros.org/initiatives/health/focus/ihrd/articles_publications_publications/overdose_20090604).
- 19 World Health Organization. (2009). *WHO Model List of Essential Medicines*. 16th List. Online at: [http://www.who.int/entity/selection\\_medicines/committees/expert/17/sixteenth\\_adult\\_list\\_en.pdf](http://www.who.int/entity/selection_medicines/committees/expert/17/sixteenth_adult_list_en.pdf).
- 20 Warner-Smith, M., Darke, S., Lynskey, M., Hall, W. (2001). Heroin overdose: Causes and consequences. *Addiction*; 96:1113-1125.
- 21 Coffin, P. et al. Op cit.
- 22 Wheeler, E. (2010). *Overdose program survey results summary*. Unpublished document; notes on file.
- 23 Dettmer, K., Saunders, B., Strang, J. (2001). Take home naloxone and the prevention of deaths from opiate overdose: Two pilot schemes. *British Medical Journal* Vol. 322.
- 24 George, S., and Moreira, K. (2008). A guide for clinicians on 'take home' naloxone prescribing. *Addictive Disorders and Their Treatments* (7)3.
- 25 Strang, J., Best, D., Man, L., Noble, A., Gossop, M. (2000). Peer-initiated overdose resuscitation: fellow drug users could be mobilized to implement resuscitation. *International Journal of Drug Policy*; 11:437-445.
- 26 Sergeev, B., et al. (2003). Op cit.
- 27 Liu, Y., et al. Op cit.
- 28 Seal, K.H., Downing, M., Kral, A.H., Singleton-Banks, S., Hammond, J., Lorrivick, J., et al. (2003). Attitudes about prescribing take-home naloxone to injection drug users for the management of heroin overdose: A survey of street-recruited injectors in the San Francisco Bay area. *Journal of Urban Health*; 80(2) 291-301.
- 29 Strang, J., Powis, B., Best, D., Vingoe, L., Griffiths, P., Taylor, C., et al. (1999). Preventing opiate overdose fatalities with take-home naloxone: pre-launch study of possible impact and acceptability. *Addiction*; 94:199-204.
- 30 Lagu, T., Anderson, B.J., Stein, M. (2006). Overdose among friends: drug users are willing to administer naloxone to others. *Journal of Substance Abuse Treatment*; 30(2): 129-133.
- 31 Strang, J., Manning, V., Mayet, S., Titherington, E., Offor, L., Semmler, C., Williams, A. (2008). Family carers and the prevention of heroin overdose deaths: Unmet training need and overlooked intervention opportunity of resuscitation training and supply of naloxone. *Drugs: Education, Prevention and Policy*; 15(2): 211-218.
- 32 Green, T.C., Heimer, R., Grau, L.E. (2008). Distinguishing signs of opioid overdose and indication for naloxone: an evaluation of six overdose training and naloxone distribution programs in the United States. *Addiction*; 103(6): 979-989.

- 33 Gaston, R.L., Best, D., Manning, V., Day, E. (2009). Can we prevent drug related deaths by training opioid users to recognize and manage overdoses? *Harm Reduction Journal*; 6:26.
- 34 Seal, K.H., Thawley, R., Gee, L., et al. (2005). Naloxone distribution and cardiopulmonary resuscitation training for injection drug users to prevent heroin overdose death: a pilot intervention study. *Journal of Urban Health*; 82: 303-311.
- 35 Tobin, K.E., Sherman, S.G., Beilenson, P., Welsh, C., Latkin, C.A. (2008). Evaluation of the Staying Alive program: Training injection drug users to properly administer naloxone and save lives; *International Journal of Drug Policy*; doi:10.1016/j.drugpo.2008.03.002.
- 36 Strang, J., Manning, V., Mayet, S., et al. (2008). Overdose training and take home naloxone for opiate users: prospective cohort study of impact on knowledge and attitudes and subsequent management of overdoses. *Addiction*; 103(10): 1648-1657.
- 37 Médecins du Monde. (2010). *Training professional injectors: A cost effective measure to reduce HIV/AIDS transmission and overdose related deaths in Kabul, Afghanistan*. Poster presented at the XVIII International AIDS Conference, Vienna, Austria.
- 38 Seal K.H., et al. (2005). Op cit.
- 39 Wagner, K., Valente, T., Casanova, M., Partovi, S.M., Mendenhall, B.M., et al. (2009). Evaluation of an overdose prevention and response training program for injection drug users in the Skid Row area of Los Angeles, CA. *International Journal of Drug Policy*; doi:10.1016/j.drugpo.2009.01.003.
- 40 Tobin, K.E., et al. Op cit.
- 41 Maxwell, S., Bigg, D., Stanczykiewicz, K., Carlberg-Racich, S. (2006). Prescribing naloxone to actively injecting heroin users: A program to reduce heroin overdose deaths. *Journal of Addictive Diseases*; 25(3).
- 42 Piper, T.M., Stancliff, S., Rudenstine, S., Sherman, S., Nandi, V., Clear, A., et al. (2008). Evaluation of a naloxone distribution and administration program in New York City. *Substance Abuse and Misuse*; 43:858–870.
- 43 Enteen, L., Bauer, J., McLean, R., Wheeler, E., Hurliaux, Kral, A., Bamberger, J.D. (2010). Overdose prevention and naloxone prescription for opioid users in San Francisco. *Journal of Urban Health*; doi:10.1007/s11524-010-9495-8.
- 44 Ibid.
- 45 New York City Department of Health and Mental Hygiene. (2010). "New Health Department Report Shows that Drug Overdose Deaths Have Declined." Available online at <http://www.nyc.gov/html/doh/html/pr2010/pr009-10.shtml>.
- 46 Doe-Simkins, M., Walley, A., Epstein, A., Moyer, P. (2009). Saved by the nose: Bystander-administered intranasal naloxone hydrochloride for opioid overdose. *American Journal of Public Health*; 99(5).
- 47 Langis, G., Walley, A. (2010). Preventing Overdose and Distributing Naloxone without a Prescription: A Workshop on Massachusetts' Public Health Approach to Bystander Training. Presentation given at the 8th National Harm Reduction Conference, Austin, U.S., November 19.
- 48 Department of Public Health. (2010). Patrick-Murray Administration Release Report Showing Life Expectancy at All-time High, Decrease in Opioid Overdose Deaths. Boston: The Commonwealth of Massachusetts, Executive Office of Health and Human Services.
- 49 Ocheret, D. "Overdose prevention in Russia." (2010). Powerpoint presentation at the Harm Reduction Coalition Conference, Austin, USA.
- 50 Wheeler, E. Op cit.
- 51 Ocheret, D. Op cit.
- 52 Personal communication with Khuat Thi Hai Oanh, SCDI. (2010). Notes on file with the Open Society Public Health Program.
- 53 Saucier, R. (2010). *Saving Lives with Naloxone: Global Update on Overdose Programming*. Vilnius: Eurasian Harm Reduction Network. Available online at [www.harm-reduction.org/images/stories/library/overdose\\_awareness\\_day\\_update.pdf](http://www.harm-reduction.org/images/stories/library/overdose_awareness_day_update.pdf).
- 54 See also Bartlett, N.A., and Xin, D.M. (2010). Data analysis of naloxone for emergency medical treatment in Gejiu. *China Harm Reduction Bulletin*; April(2):5-6; and Liu, Y. A. (2010). Trial of free distribution of naloxone in the Ningbo area, *China Harm Reduction Bulletin*; April(2):3; Case reports on naloxone for medical treatment, *China Harm Reduction Bulletin*; April(2):11. (all in Chinese).
- 55 Saucier, R. Op cit.
- 56 Tobin, K.E., et al. Op cit.
- 57 Sherman, S.G., et al. (2008). Op cit.
- 58 Seal K.H., et al. (2005). Op cit.
- 59 Pollini, R.A., McCall, L., Mehta, S.H., Vlahov, D., Strathdee, S.A. (2006). Non-fatal overdose and subsequent drug treatment among injection drug users. *Drug and Alcohol Dependence*; 83(2): 104-110.
- 60 Sherman, S.G., et al. (2008). Op cit.
- 61 Maxwell, S. (2006). Op cit, 92.

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