The Connection Between Housing and Healthcare Needs: Growing Evidence Base for Housing as a Social Determinant of Health

- Housing Is A Key Determinant Of Health. Poor living conditions, caused by poverty and homelessness, affect people's vulnerability to illness and disease and their ability to benefit from treatment and manage their conditions. People who are homeless have to contend with contact with communicable diseases and infections, exposure to extreme weather, malnutrition, stress, lack of running water to maintain cleanliness, and lack of refrigeration for medication.¹
- **People Who Are Homeless Are At Greater Risk For Poor Health.** They have high rates of infectious and acute illnesses (skin diseases, TB, pneumonia, asthma); chronic diseases (diabetes, hypertension, HIV/AIDS, cardiovascular disease); poor mental health and/or substance abuse; and being victims of violence. In addition, their mortality rate is 3-4 times higher than for the general population.²
- Health Issues Are Likely To Increase As The Homeless Population Ages. The number of homeless people in the U.S. between the ages of 51-61 increased 32% from 2007 to 2013.³ Rates of chronic health conditions and potential for extended stays in nursing homes increase with age.
- HIV/AIDS is Correlated with Homelessness. Many domiciled individuals face the threat of homelessness once they or someone in their family becomes infected with HIV/AIDS. Additionally, people experiencing homelessness are at risk of contracting HIV due to the prevalence of high risk behaviors such as injection drug use, unsafe sex, and "survival sex" (i.e. the exchange of sex for food, shelter, or money).⁴ Studies indicate the prevalence of HIV among homeless people can be as high as 20%.⁵
 - → Lack of housing has been identified as one of the top 5 barriers for HIV+ persons accessing medical care.⁶
 - → In 2014, HIV+ persons with stable housing had a viral suppression rate of 84.4%; only 45% of those with unstable housing achieved viral suppression.⁷
 - → 21.7% of HIV+ respondents to a services needs survey indicated that they were homeless at some point in the last year.⁸
 - → Of the estimated 3.5 million people who are homeless every year in the U.S. as many as 3.4% are HIV positive, a rate 3 times higher than that of the general population.⁹
 - → In Houston, approximately 1 out of every 12 homeless persons was diagnosed with HIV in 2013, and 1.6% of homeless persons report that they were triggered into homelessness by an HIV diagnosis.¹⁰
 - → In Northeast Georgia, 82% of the clients served by AIDS Athens live below the poverty line.¹¹
- Homelessness Is Correlated With High Health Care Costs. The high proportion of complex health needs and co-occurring health and behavioral health disorders increases the number, intensity, and scope of the services needed. Homelessness inhibits the long-term, consistent care needed for many of these conditions, with the result that problems are aggravated, making them more dangerous and more costly. Homelessness also increases the likelihood of excessive use of the ER, inpatient treatment, and crisis services.
 - → A report in the New England Journal of Medicine documents that homeless people spent an average of four days longer per hospital visit than comparable non-homeless people at an extra cost of approximately \$2,414 per hospitalization.¹²

⁵ National Coalition for the Homeless, (2007). HIV/AIDS and homelessness [Online], <u>www.nationalhomeless.org/publications/facts/HIV.pdf</u>

¹ Social Determinants of Health, Office of Disease Prevention and Health Promotion, U.S. Department of Health and Human Services, retrieved March 30, 2015, http://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-health.

² <u>http://www.cdc.gov/features/homelessness/</u> and Kaiser Commission on Medicaid and the Uninsured, "Medicaid Coverage and Care for the Homeless Population: Key Lessons to Consider for the 2014 Medicaid Expansion", September 2012, available at: <u>http://kaiserfamilyfoundation.files.wordpress.com/2013/01/8355.pdf</u>

³ End Chronic Homelessness Policy Academy Team presentation delivered at Washington Legislature Adult Behavioral Health System Task Force Meeting on September 19,2014. For more information, please contact Gillian Morshedi (gillian@homebaseccc.org) at HomeBase.

⁴ St. Lawrence, J., Brasfield, T.L. (1995). HIV risk behavior among homeless adults. AIDS Education and Prevention, V. 7, 22-31. Guildford Press: New York.

⁶ Jennifer A. Pellowski, "Barriers to care for rural people living with HIV: A Review of domestic research and health care models," J Assoc Nurses AIDS Care. 2013 Sep-Oct; 24(5): 422–437.

⁷ Thakarar K et al, "Homelessness, HIV, and Incomplete Viral Suppression," Journal of Health Care for the Poor and Underserved," February 27, 2016 (1): 145-156. ⁸ Rickles, M. 2015. Ryan White Part A Nashville Transitional Grant Area 2015 Needs Assessment. Retrieved from: <u>nashrpc.com/data</u>. Nashville Regional HIV Planning Council.

⁹ National Alliance to End Homelessness (2006). "Fact Sheet: Homelessness and HIV/AIDS." Available at: <u>http://www.endhomelessness.org/library/entry/fact-sheet-homelessness-and-hiv-aids</u>

¹⁰ The 2013 Houston Area Integrated Epidemiologic Profile for HIV/AIDS Prevention and Care Services Planning. Reporting period: January 1 to December 31, 2011. Available at: <u>http://www.rwpchouston.org/Publications/2013%20Epi%20Profile%20--%20APPROVED%20--%2005-09-13.pdf</u>

¹¹ AIDS Athens, "HIV/AIDS Statistics," 2015, <u>http://aidsathens.org/get-support/hivaids-statistics/</u>.

¹² Salit S.A., Kuhn E.M., Hartz A.J., Vu J.M., Mosso A.L. Hospitalization costs associated with homelessness in New York City. New England Journal of Medicine 1998; 338: 1734-1740.

- → In California, the Frequent Users of Health Services Initiative found that approximately 45 percent of individuals who were high utilizers of emergency departments were homeless.¹³
- → 37 homeless men and women in Asheville, North Carolina, over a three-year period, cost the City and County over \$800,000 each year. The total costs included \$120,000 for 280 episodes of EMS services, and \$425,000 in hospitalization costs.¹⁴
- → A 2014 New Mexico study found 13% decrease in emergency room costs and 83.8% decrease in hospital inpatient costs after study group members were housed for a year, compared to the prior year.¹⁵
- → A two-year study in Boise, Idaho led to an estimate that homeless services for one person experiencing chronic homelessness in Boise for one year ranges from \$40,000-\$85,000, including case management, police, incarceration, paramedics, fire department, emergency room, hospital care, and shelter services.¹⁶
- → A 2012 study by the City of Knoxville found that the cost of community services (case management, emergency shelter, supportive services, jail stays, and emergency medical services) for 41 chronically homeless individuals decreased by \$76,721 after one year in permanent supportive housing.¹⁷
- → A 2009 study in Chicago found that without healthcare or housing interventions, 204 homeless adults with chronic medical illnesses experienced 743 hospitalizations and 3.77 emergency room visits per person per year over an 18-month period.¹⁸
- → A study conducted by West Virginia University (WVU) and the West Virginia Coalition to End Homelessness found that 267 persons experiencing homelessness who received care at WVU Ruby Memorial Hospital over a one-year period incurred \$5,979,463 in service costs, including 785 emergency department visits totaling \$1,128,036 in care costs and 257 inpatient stays totaling \$3,743,699 in care costs.¹⁹
- → According to a University of Texas two-year survey of homeless individuals, each person costs the taxpayers \$14,480 per year across public systems, primarily for overnight jail.²⁰
- → A Clarke county study released in February 2007 found that Athens hospitals spent at least \$12.4 million in 2005 caring for the homeless, an average of almost \$20,000 per homeless patient.²¹
- → A Philadelphia homelessness cost study found that the top 20% of individuals experiencing chronic homelessness plus substance abuse cost the City approximately \$22,000 per person per year in behavioral health services, homeless services, prison, and jail.²²
- → A study of hospital admissions of homeless people in Hawaii revealed that 1,751 adults were responsible for 564 hospitalizations and \$4 million in admission costs. Their rate of psychiatric hospitalization was over 100 times higher than their non-homeless cohort.²³
- → A 2004 analysis of Duval County conservatively estimated taxpayers pay \$35,000,000 a year providing services for the homeless, including healthcare system costs such as emergency rooms, untreated illnesses, unreimbursed expenses, ambulance service, and crisis stabilization units.²⁴
- → A 2014 report found that the average annual cost for incarceration, emergency rooms and inpatient hospitalizations for a cohort of 107 chronically homeless individuals in Florida's Orange, Seminole and Osceola counties is \$3,323,955.²⁵

http://www.dca.state.ga.us/housing/specialneeds/publications/2008HTFAnnualReport.pdf.

¹³ Linkins, Brya, & Chandler, 2008, available at: <u>http://www.aidschicago.org/pdf/2009/hhrpn/FUHCS/1-FrequentUsersofHealthServicesInitiative-FinalEvaluation.pdf</u> ¹⁴ From National Academy for State Health Policy, "Chronic Homeless and High Users of Health Services" available at

http://nashp.org/sites/default/files/chronic_homelessness.pdf?q=Files/chronic_homelessness.pdf

Charlotte Chaplan, Staff Report: 10-Year Plan to End Homelessness, (Asheville, NC and Buncombe County, NC January 11, 2005); retrieved 16 November 2007; http://www.ich.gov/slocal/plans/asheville.pdf.)

¹⁵ Study by Institute for Social Research, June 2014. From: http://news.unm.edu/news/unm-study-reveals-cost-benefits-in-housing-the-homeless

¹⁶ Boise's 10 Year Plan to Reduce and Prevent Chronic Homelessness, November 2007., available at: https://www.cdaid.org/files/municipal_services/Boise10YrPlan.pdf ¹⁷ Study by the City of Knoxville, "Comparative Costs and Benefits of Permanent Supportive Housing in Knoxville, Tennessee," 2012, available at:

http://shnny.org/uploads/Knoxville-study.pdf.

¹⁸ <u>http://www.aidschicago.org/resources/legacy/pdf/2012/chhp_data_sheet_2012.pdf</u> and <u>http://usich.gov/usich_resources/solutions/explore/chicago_housing_for_health_partnership.</u>

¹⁰ R, David Parker, "An inexpensive, interdisciplinary, methodology to conduct an impact study of homeless persons on hospital based services," as cited in the West Virginia Interagency Council on Homelessness 2014 Report, available at:

http://www.wvcommerce.org/App_Media/assets/download/ndrc/WVICH_Progress_Report_2014.pdf.

²⁰ National Alliance to End Homelessness, "Cost of Homelessness," <u>http://www.endhomelessness.org/pages/cost_of_homelessness.</u>

²¹ "Cost Analysis of Medical Services to Homeless Persons" (2007) Athens-Clarke County Dept. of Human and Economic Development, as cited in "Addressing Homelessness through Collaboration," State Housing Trust Fund Annual Report, January 1, 2008,

²² Stephen R. Poulin, Marcella Maguire, Stephen Metraux, and Dennis P. Culhane. "Service Use and Costs for Persons Experiencing Chronic Homelessness in Philadelphia: A Population-Based Study" *Psychiatric Services* 61.11 (2010): 1093-1098.

²³ Martell J.V., Seitz R.S., Harada J.K., Kobayashi J., Sasaki V.K., Wong C. Hospitalization in an urban homeless population: the Honolulu Urban Homeless Project. Annals of Internal Medicine 1992; 116:299-303.

²⁴ Ability Housing, "Home is Where Our Heart Is," 2007 Annual Report, <u>http://abilityhousing.org/docs/AH_07AnnualReport.pdf</u>.

- → A 2010 study by the U.S. Department of Housing and Urban Development (HUD) found that in Kalamazoo Medicaid costs for children in a cohort of homeless families were 26% higher than the statewide average Medicaid cost for children; Medicaid costs for adults were 78% higher than the statewide average.²⁶
- → In New York, over 89% of people predicted to be at high risk for hospital readmissions were homeless.²⁷
- → In 2009, the emergency department of St. Patrick Hospital in Missoula, MT was visited by 514 people identified as homeless. These individuals accounted for 1,219 separate visits to the ER and were provided with \$3,028,359 in charity care. Three years later in 2012, the cost was closer to \$4,000,000.²⁸
- → As of 2009, Billings estimated each homeless person cost the city over \$15,000 per year in public services, with an an estimated cost of \$115,000 to serve each chronically homeless individual per year. With nearly 2,400 people experiencing homelessness in Billings each year, costs exceed \$54 million annually.²⁹
- → A rough estimate for the total annual cost of homelessness in Flathead County, Montana in 2013 was in the multi-million dollar range.³⁰
- Permanent Supportive Housing (PSH) Improves Health Outcomes And Reduces Health Care Costs. PSH, affordable housing linked with comprehensive health and support services, serves people with severe and complex needs, including those who have been chronically homeless. Research and experience repeatedly document that PSH results in reductions in costs for hospitalization, emergency room visits, crisis services, shelter, jail, and detox; high rates of housing stability and retention; and improved health and recovery. Changes under the ACA expand opportunities to use Medicaid to fund PSH services.³¹

SUCCESSFUL PERMANENT SUPPORTIVE HOUSING PROGRAMS

1811 Eastlake in Seattle, WA³²

- Serves: Chronically homeless people with severe alcoholism & high use of crisis services
- **Outcomes**: Significant cost reduction in service usage (health, behavioral health, criminal justice and shelter) after one year of enrollment with median monthly costs dropping from \$4,066/person to \$958/person and alcohol use dropping by about a third. The savings far exceed the cost of the housing.

Denver Housing First Collaborative³³

- Serves: 100 chronically homeless individuals with disabilities
- **Outcomes**: Comparing 2 years pre-housing with 2 years post-housing, residents had 34% fewer ER visits, 40% fewer inpatient visits, 82% fewer detox visits, and 76% fewer incarceration days.

San Francisco Direct Access to Housing³⁴

- Plaza Apartments serves high cost system users.
- Outcomes: Approximately \$2,226,568 million in healthcare reductions in first year.
- Mission Creek serves 51 homeless seniors.
- Outcomes: 82% reduction in total cost of health care utilization, including emergency department, hospital

https://www.youtube.com/watch?v=32xyeUzTqys&feature=player_embedded

28 Missoula Reaching Home Workgroup, "Reaching Home: Missoula's 10-Year Plan to End Homelessness 2012-2022," October 2012: 11,

http://www.ci.missoula.mt.us/DocumentCenter/View/21013

http://www.ci.billings.mt.us/DocumentCenter/Home/View/4985

²⁵ Central Florida Commission on Homelessness, "The Cost of Long-Term Homelessness in Central Florida," 2014,

http://abilityhousing.org/docs/AH_07AnnualReport.pdf.

²⁶ U.S. Department of Housing and Urban Development, "Costs Associated with First-Time Homelessness for Families and Individuals," March 2010, https://www.huduser.gov/publications/pdf/Costs Homeless.pdf.

²⁷ California Department of Health Care Services Webinar, "Medi-Cal Managed Care Plans and Homeless Members," October 1, 2014. Available at:

²⁹ City of Billings Mayor's Committee on Homelessness Community Development Division, "Welcome Home Billings," October 2009: 5,

³⁰ Flathead Homelessness Interagency Resource and Education, "Finding the Way Home: Five-Year Plan to Address Homelessness (2014-2019)," 2014: 13, http://flatheadhealth.org/wp-content/uploads/2015/01/5-Year-Plan-to-Address-Homelessness.pdf

³¹ ASPE, Medicaid and Permanent Supportive Housing for Chronically Homeless Individuals: Emerging Practices from the Field, available at: http://aspe.hhs.gov/daltcp/reports/2014/EmergPrac.pdf

³² Downtown Emergency Service Center, "JAMA Research Shows Housing for Homeless Saves Taxpayers Millions," April 2009,

http://www.desc.org/documents/DESC_1811_JAMA_info.pdf and Mary E. Larimer, et al, ""Health Care and Public Service Use and Costs Before and After Provision of Housing for Chronically Homeless Persons with Severe Alcohol Problems," JAMA, 2009, <u>http://shnny.org/uploads/Health_Care_and_Public_Service_Use.pdf.</u> ³³Jennifer Perlman and John Parvensky, "Denver Housing First Collaborative: Cost Benefit Analysis and Program Outcomes Report," Colorado Coalition for the Homeless,

December 11, 2006, http://www.denversroadhome.org/files/FinalDHFCCostStudy_1.pdf.

³⁴ San Francisco Department of Public Health, Cost-Effective Strategies for Housing Homeless Clients presentation.

inpatient, psych inpatient and skilled nursing facilities.

Moore Place, a Housing Works Program of the Urban Ministry Center in Charlotte, NC³⁵

- **Serves**: adults with extensive histories of homelessness and a disabling condition (mental health and substance abuse disorders, chronic health disorders, physical disabilities, developmental disabilities).
- **Outcomes**: 2014 study reported area hospital bills, emergency room visits, and lengths of hospitalizations significantly decreased during tenants' first year of housing.

Healthy Home Peer Experts Supportive Housing Program, Santa Fe County, NM³⁶

- Serves: adults with severe mental illness & co-occurring disorders experiencing or at risk of homelessness • Outcomes: As of April, provided housing supports to 282 individuals. Comprehensive Community Support
- Services by Certified Peer Support Specialists. Created Peer Evaluator position and accompanying manual.

The Next Door Freedom Recovery Community in Nashville, TN³⁷

- Serves: Homeless single women and mothers diagnosed with a substance abuse addiction and/or a mental illness, many of whom have been incarcerated
- **Outcomes**: The recidivism rate for formerly incarcerated women who stay at least 90 days is only 20%, compared to a statewide average of over 60%. 72% of residents find employment within 25 business days of admission, with an average of 17 days from admission to employment.

Chicago Housing for Health Partnership³⁸

- Serves: Chronically ill homeless individuals
- **Outcomes**: 1/3 fewer inpatient hospital days and 1/4 fewer emergency room visits for program participants as compared to their peers relying on the usual care system. Evidence indicates that every 100 chronic homeless individuals housed will save \$1 million in public funds/year and every 100 short term homeless individuals housed will save \$630,000/year.

Housing Crisis Center in Dallas, TX³⁹

- Serves: 105 chronically homeless disabled adults, primarily veterans.
- **Outcomes**: The Housing Crisis Center houses each chronically homeless individuals for approximately \$10,000 annually, compared to an average cost of \$60,000-\$100,000 to care for someone who is chronically homeless on the streets of Dallas. In 2013, residents demonstrated a 96% increase in housing stability, 59% increase in income, and 100% increase in sense of self-determination.

AIDS Athens in Athens, GA⁴⁰

• Serves: Homeless persons living with HIV/AIDS

Outcomes: Those AIDS Athens' housed in 2013/14 experienced a 69% reduction in incarceration rates, 93% compliance with medical care, and a 17% increase in earned income due to improved health.

Housing Initiatives, Inc. in Madison, WI ⁴¹

• Serves: Homeless persons living with severe mental illness

Outcomes: Housing Initiatives provides PSH to clients for \$10,000/year (compared to the estimated \$40,000/year spent by tax-payers on mentally ill persons who are homeless), with 95% of clients never returning to homelessness.

Pathways to Housing PA in Philadelphia, PA⁴²

- Serves: Chronically ill, seriously mental ill homeless individuals
- **Outcomes**: Comparing one year pre-housing to one-year post housing, Community Behavioral Health hospitalization episodes decreased by 70 and mental health hospitalizations decreased by 54%. The program saves the public a total of \$421,893 per year, or \$4,219 for each client served.

Ability Housing in Jacksonville, FL⁴³

³⁵ Urban Ministry Center, "Permanent Supportive Housing," 2015, <u>http://www.urbanministrycenter.org/helping-the-homeless/housing-for-homeless/.</u>
³⁶ From New Mexico's Application for FY 2015 Cooperative Agreements to Benefit Homeless Individuals for States (CABHI-States) grants.

³⁷GuideStar, "The Next Door," 2015, <u>https://www.guidestar.org/organizations/43-2001774/next-door.aspx</u>.

³⁸AIDS Chicago, "Studies on Supportive Housing Yield Results for Health of Homeless and Cost Savings," Data Sheet, 2012, http://www.aidschicago.org/ndf/2012/chhp.data.choot.2012.ndf

http://www.aidschicago.org/pdf/2012/chhp_data_sheet_2012.pdf

³⁹Housing Crisis Center, "2013 Annual Report," <u>http://www.hccdallas.org/wp-content/uploads/2014/04/HCC_2013_AnnualReport.pdf</u> ⁴⁰ AIDS Athens, "Annual Report 2013/14," <u>http://aidsathens.org/wp-content/uploads/2015/06/2013-2014-Annual-Report.pdf</u>.

⁴¹ Housing Initiatives, Inc., "2014 Annual Report," <u>http://housinginit.org/wp-content/uploads/2015/08/Final-HII-2014-Report.pdf.</u>

⁴² Center City District, "Evaluation of Pathways to Housing PA," January 2011:

https://c.ymcdn.com/sites/www.philanthropynetwork.org/resource/resmgr/research_reports/pathways_to_housing_report_pdf

⁴³ Ability Housing, "2013 Annual Report to the Community," <u>http://abilityhousing.org/wp-content/uploads/2014/08/2013_AnnualReport_AbilityHousing.pdf</u>.

- Serves: Persons experiencing homelessness, at-risk of homelessness, and adults with disabilities.
- **Outcomes:** In 2013, Ability Housing housed 204 formerly homeless persons with a 91% housing stability rate. Provided 720 hours of case management services and saw decreased community crime, police and jail expenses, community medical expenses, and use of emergency services.

Cooper House in Fargo, ND⁴⁴

- Serves: Homeless individuals, with preference given to those experiencing chronic or long-term homelessness, veterans, and people with disabilities.
- Outcomes: After one year of housing, there was a total cost savings for all residents of \$204,140, including a decrease in healthcare and medical costs of \$15,130 (10%) and a drop in detox costs of \$53,520 (71%).

Neighborhood Service Organization (NSO) Bell Building in Detroit, MI⁴⁵

- Serves: 155 one-bedroom apartments serving homeless and formerly homeless adults
- **Outcomes:** The NSO Bell Building is expected to save taxpayers more than \$5 million annually, as some estimates show that a single person experiencing chronic homelessness can cost taxpayers \$50,000 or more a year in police calls, ambulance calls, emergency room visits, and time spent in the hospital.

Lansing Inn & Hill Street Inn, Joseph's House and Shelter in Troy, NY⁴⁶

- Serves: 55 single homeless adults, most chronically homeless with severe and persistent mental illness
- Outcomes: Lansing Inn & Hill Street Inn have an 85% retention rate, with five residents newly enrolling in SSI/SSDI benefits and an average tenant income increase by \$206 once housed.

FOCUS ON "MAINSTREAMING"

HUD strongly encourages and incentivizes communities to apply the resources of a broad spectrum of health, education, human, and social services programs to the response to homelessness. This "mainstreaming" approach is also found in the Homeless Emergency and Rapid Transition to Housing (HEARTH) Act of 2009.

HUD's study, "Strategies for Improving Homeless People's Access to Mainstream Benefits and Services," found that communities intent on improving access to mainstream services had success reducing structural barriers.⁴⁷

The U.S. Interagency Council on Homelessness (USICH)'s "Opening Doors: Federal Strategic Plan to Prevent and End Homelessness," as amended in 2015, outlines an interagency collaboration that aligns mainstream housing, health, education, and human services to prevent Americans from experiencing homelessness.⁴⁸ The Plan emphasizes the full integration of targeted programs with mainstream programs, and calls on all relevant mainstream programs to prioritize housing stability for people experiencing or at risk of homelessness.

⁴⁴ Dan Madler (Beyond Shelter, Inc.), "Providing More Than A Roof: Supportive Housing Collaboration," NDHFA 2014 Statewide Housing Conference, https://www.ndhfa.org/About%20Us/HousingConference/2014/Madler-ProvidingMorethanRoof.pdf.

⁴⁵ Neighborhood Service Organization, "NSO Bell Building," <u>http://www.nso-mi.org/bell-building.php</u>.

⁴⁶ Joseph's House and Shelter, "Joseph's House Statistics," Joseph's House & Shelter, Inc. 2015 Annual Report, <u>http://www.josephshousetroy.org/?page_id=99</u> ⁴⁷ Martha Burt, et al, "Strategies for Improving Homeless People's Access to Mainstream Benefits and Services," March 2010, http://www.incomence.com/services/access/comence.com/services/access/comence.com/services/access/com/services/access/com/services/access/com/services/access/com/services/access/com/services/access/com/services/access/com/services/com/services/access/com/services/access/com/services/access/com/services/access/com/services/com/serv

http://www.huduser.org/portal/publications/povsoc/homeless_access.html

⁴⁸ U.S. Interagency Council on Homelessness, "Opening Doors: Federal Strategic Plan to End Homelessness," Amended 2015: 29,42. http://usich.gov/resources/uploads/asset_library/USICH_OpeningDoors_Amendment2015_FINAL.pdf.