Estimated over 250 million privately owned firearms in the U.S (National Rifle Association)

15% or 34.4 million people participated in shooting sports in 2009 (National Shooting Sports Foundation)

1.7 million youth hunters, ages 6-15 years (Families Afield Report, 2010)
The legal age to hunt with a firearm is 10 years of age and younger in many states.

Some states have no minimum age as long as youths are accompanied by an adult.

Department of Natural Resources in many states are aggressively promoting youth shooting sports (to recruit future hunters and increase revenues).
## Rules for Young Hunters (Up to 16 Years of Age)

The following table explains which species youth are allowed to hunt, with an appropriate license. Nonresidents up to and including 16 years old may purchase resident and junior licenses, except nonresidents are not eligible to apply for a Michigan elk license, including nonresident youth.

<table>
<thead>
<tr>
<th>Species and Age</th>
<th>9 or younger</th>
<th>10-13</th>
<th>14-16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Game and Waterfowl</td>
<td>Yes&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Turkey</td>
<td>Yes&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Fur Harvester</td>
<td>Yes&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Trap-only Fur Harvester</td>
<td>Yes&lt;sup&gt;3&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Deer</td>
<td>Yes&lt;sup&gt;3&lt;/sup&gt;-3</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;-2</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Bear</td>
<td>No</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;-2</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Elk</td>
<td>No</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;-2</td>
<td>Yes&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1. If hunter safety certified and accompanied by an adult 18 years or older, or a youth apprentice with an apprenticeship license and accompanied by a parent, guardian or someone 21 or older. "Accompanied by" requires the adult to be able to come to the immediate aid of the apprentice and stay within a distance from the apprentice which allows uninterrupted, unaided visual and verbal contact.

2. Youth less than 14 years of age may hunt with archery and crossbow on public or private lands or with a firearm on private or Commercial Forest lands only.

3. If in possession of a Mentored Youth Hunting license and accompanied by an adult mentor 21 years old or older, with hunting experience, who has a valid Michigan hunting license other than an apprentice license.
Try out your young hunter’s new gun at the shooting range

Michigan DNR [MIDNR@govsubscriptions.michigan.g...  

To: Stewart, Michael G.

Friday, October 12, 2012 3:16 PM

You get a new firearm for your young hunter? Try it out at your local DNR shooting range and get in some practice before heading into the field.

More information about youth hunting, including a list of resources for mentors, visit michigan.gov/mentoredhunting.

Miss your shot – visit a DNR shooting range to get for hunting season. Buy your hunting applications online at E-License.

Us RIBER SERVICES:
Subscriptions | Unsubscribe All | Help
Free junior hunting licenses at Meijer Friday and Saturday

Hunting

Free junior hunting licenses are available at Meijer stores today and Saturday, Sept. 14 and 15. Just print the coupon below and bring it in to your local Meijer store.

The DNR would like to thank Meijer for providing this generous offer to young hunters for the past several years. For more information about hunting in Michigan, visit [www.michigan.gov/hunting](http://www.michigan.gov/hunting).
The purpose of this study was to survey youth recreational firearm users regarding their shooting habits, reported use of hearing protection devices (HPDs), attitudes about NIHL, and self-assessed auditory status.
Procedures

- Joint effort between Central Michigan University and the University of Northern Colorado
- IRB proposals were approved at both institutions
- Recruiting display in each sporting goods store
- Prospective subjects and their parents were contacted upon entering the stores
- A pair of insert HPDs were used as an incentive to participate
- The raw data was coded and analyzed utilizing Excel software and descriptive statistics were generated
Procedures cont.

Materials

- 24-item Survey
  - Demographic information
  - Shooting habits
  - Attitudes about firearm NIHL
  - Use of hearing protection
  - Self-assessed auditory status

- Interview Style Format
Subjects
- 210 recreational firearm users, ages 10 to 17 years
- Mean age was approximately 13 years
- 89% male and 11% female
  - 128 from MI
  - 71 from CO
  - 10 from WY
  - 1 from IL

Comparison of age between Michigan and Colorado youth recreational firearm users (MI n=128, CO n=82)

<table>
<thead>
<tr>
<th>Age</th>
<th>MI Data</th>
<th>CO Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>9%</td>
<td>17%</td>
</tr>
<tr>
<td>11</td>
<td>13%</td>
<td>18%</td>
</tr>
<tr>
<td>12</td>
<td>20%</td>
<td>14%</td>
</tr>
<tr>
<td>13</td>
<td>21%</td>
<td>18%</td>
</tr>
<tr>
<td>14</td>
<td>9%</td>
<td>17%</td>
</tr>
<tr>
<td>15</td>
<td>10%</td>
<td>10%</td>
</tr>
<tr>
<td>16</td>
<td>14%</td>
<td>7%</td>
</tr>
<tr>
<td>17</td>
<td>5%</td>
<td>7%</td>
</tr>
</tbody>
</table>
Demographic information cont.

- 86% Right Handed
- Mean age starting shooting firearms was 9.5 years
  - Range 18 months to 17 years
- The majority (79%) of these YRFUs started shooting at before the age of 10 years
Results: Shooting Habits

Caliber/Gauge when Hunting SMALL game

% of Respondents

Caliber / Gauge

<table>
<thead>
<tr>
<th>Caliber / Gauge</th>
<th>MIDATA</th>
<th>COData</th>
</tr>
</thead>
<tbody>
<tr>
<td>.17</td>
<td>0%</td>
<td>2%</td>
</tr>
<tr>
<td>.22</td>
<td>34%</td>
<td>35%</td>
</tr>
<tr>
<td>.243</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>.410</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>30.30</td>
<td>1%</td>
<td>0%</td>
</tr>
<tr>
<td>12 Ga</td>
<td>26%</td>
<td></td>
</tr>
<tr>
<td>16 Ga</td>
<td>15%</td>
<td></td>
</tr>
<tr>
<td>20 Ga</td>
<td>23%</td>
<td>44%</td>
</tr>
</tbody>
</table>
Results: Shooting Habits

Caliber/Gauge when hunting **LARGE** game

<table>
<thead>
<tr>
<th>Caliber / Gauge</th>
<th>MIDATA</th>
<th>CODATA</th>
</tr>
</thead>
<tbody>
<tr>
<td>.270</td>
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<td>18%</td>
</tr>
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<td>30.30</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>.243</td>
<td>5%</td>
<td>11%</td>
</tr>
<tr>
<td>30.06</td>
<td>5%</td>
<td>7%</td>
</tr>
<tr>
<td>.308</td>
<td>4%</td>
<td>23%</td>
</tr>
<tr>
<td>12 Ga</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>20 Ga</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>7mm</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>.44</td>
<td>4%</td>
<td>0%</td>
</tr>
<tr>
<td>Other</td>
<td>16%</td>
<td>37%</td>
</tr>
</tbody>
</table>

% of Respondents
Results: Shooting Habits

Firearm Action while Hunting Small Game

- Over 75% reported use of multiple shot firearms

- Percentages of Respondents:
  - Bolt: MIDATA 11%, CODATA 15%, TotalDATA 21%
  - Double Barrel: MIDATA 2%, CODATA 0%, TotalDATA 1%
  - Lever: MIDATA 3%, CODATA 4%, TotalDATA 3%
  - Pump: MIDATA 38%, CODATA 33%, TotalDATA 36%
  - Semi-Auto: MIDATA 21%, CODATA 21%, TotalDATA 21%
  - Single: MIDATA 24%, CODATA 21%, TotalDATA 23%

Firearm Action:
- Bolt
- Double Barrel
- Lever
- Pump
- Semi-Auto
- Single
Firearm Action while Hunting Large Game

- Over 80% reported use of multiple shot firearms
- CO youths much more likely to use bolt action firearms—probably due to hunting environment.

Results: Shooting Habits

% of Respondents

<table>
<thead>
<tr>
<th>Firearm Action</th>
<th>MIDATA</th>
<th>CODATA</th>
<th>TotalData</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolt</td>
<td>42%</td>
<td>18%</td>
<td>49%</td>
</tr>
<tr>
<td>Lever</td>
<td>15%</td>
<td>0%</td>
<td>11%</td>
</tr>
<tr>
<td>Pump</td>
<td>11%</td>
<td>11%</td>
<td>9%</td>
</tr>
<tr>
<td>Semi-Auto</td>
<td>18%</td>
<td>10%</td>
<td>11%</td>
</tr>
<tr>
<td>Single</td>
<td>11%</td>
<td>11%</td>
<td>17%</td>
</tr>
</tbody>
</table>
Results: Shooting Habits

Reported number of shots taken per year while hunting **small** game (MIN=98, CO N=52).

- **1-10 shots/year:**
  - MIDATA: 50%
  - CODATA: 40%
  - Total: 21%

- **11-50 shots/year:**
  - MIDATA: 30%
  - CODATA: 36%
  - Total: 32%

- **51-100 shots/year:**
  - MIDATA: 12%
  - CODATA: 11%

- **101-150 shots/year:**
  - MIDATA: 4%
  - CODATA: 8%
  - Total: 5%

- **151-200 shots/year:**
  - MIDATA: 1%
  - CODATA: 8%
  - Total: 3%

- **201+ shots/year:**
  - MIDATA: 15%
  - CODATA: 9%

Reported number of shots taken per year while hunting **large** game (MIN=94, CO N=22).

- **1-10 shots/year:**
  - MIDATA: 82%
  - CODATA: 68%

- **11-50 shots/year:**
  - MIDATA: 15%
  - CODATA: 23%

- **51-100 shots/year:**
  - MIDATA: 3%
  - CODATA: 9%

- **101-150 shots/year:**
  - MIDATA: 0%
  - CODATA: 0%

- **151-200 shots/year:**
  - MIDATA: 0%
  - CODATA: 0%

- **201+ shots/year:**
  - MIDATA: 0%
  - CODATA: 0%

**High risk** areas are indicated by black arrows.
Results: Shooting Habits

REPORTED # OF SHOTS TAKEN PER YEAR
WHILE TARGET SHOOTING

High risk

% of Respondents

# of Shots per Year

- MIDATA
- CODATA
- TotalDATA

- 1-10: 22%
- 11-50: 34%
- 51-100: 14% 14% 14%
- 101-150: 8% 10% 9%
- 151-200: 6% 8% 7%
- 201+: 16% 26% 41%
**Results: Shooting Habits**

**REPORTED HANDGUN USE**

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIDATA</td>
<td>42%</td>
</tr>
<tr>
<td>CODATA</td>
<td>66%</td>
</tr>
</tbody>
</table>

**REPORTED USE OF AN ENCLOSED BLIND WHILE HUNTING LARGE GAME**

- **MI kids likely to hunt from a blind—high risk**

<table>
<thead>
<tr>
<th>Always</th>
<th>Usually</th>
<th>Half-time</th>
<th>Rarely</th>
<th>Never</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIDATA</td>
<td>31%</td>
<td>23%</td>
<td>13%</td>
<td>18%</td>
</tr>
<tr>
<td>CODATA</td>
<td>0%</td>
<td>4%</td>
<td>5%</td>
<td>8%</td>
</tr>
</tbody>
</table>

% of Respondents
DOES FIREARM NOISE CAUSE HEARING LOSS? (N=210)

- 77% Yes
- 23% No

SHOULD HPDs ALWAYS BE WORN WHEN SHOOTING? (N=210)

- 77% Yes
- 23% No
Results: HPD Reported Use

USE OF HPDS DURING TARGET SHOOTING

<table>
<thead>
<tr>
<th>Use of HPDS</th>
<th>MIDATA</th>
<th>CODATA</th>
<th>TotalData</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>51%</td>
<td>64%</td>
<td>56%</td>
<td>56%</td>
</tr>
<tr>
<td>Usually</td>
<td>15%</td>
<td>18%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Half-time</td>
<td>3%</td>
<td>9%</td>
<td>5%</td>
<td>5%</td>
</tr>
<tr>
<td>Rarely</td>
<td>11%</td>
<td>3%</td>
<td>8%</td>
<td>8%</td>
</tr>
<tr>
<td>Never</td>
<td>20%</td>
<td>6%</td>
<td>15%</td>
<td>15%</td>
</tr>
</tbody>
</table>

High risk

USE OF HPDS DURING HUNTING ACTIVITIES

<table>
<thead>
<tr>
<th>Use of HPDS</th>
<th>MIDATA</th>
<th>CODATA</th>
<th>TotalData</th>
<th>% of Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>11%</td>
<td>25%</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Usually</td>
<td>7%</td>
<td>13%</td>
<td>9%</td>
<td>9%</td>
</tr>
<tr>
<td>Half-time</td>
<td>7%</td>
<td>4%</td>
<td>6%</td>
<td>6%</td>
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<td>Rarely</td>
<td>4%</td>
<td>13%</td>
<td>7%</td>
<td>7%</td>
</tr>
<tr>
<td>Never</td>
<td>71%</td>
<td>45%</td>
<td>62%</td>
<td>62%</td>
</tr>
</tbody>
</table>

High risk
Results: Type of HPDs used

TYPE OF HPD WORN WHILE TARGET SHOOTING

- Plugs: 37%
- Muffs: 44%
- Both Plug & Muff: 14%
- EHPDs: 2%
- Plugs or Muffs: 3%

TYPE OF HPD WORN WHILE PARTICIPATING IN HUNTING ACTIVITIES

- Plugs: 47%
- Muffs: 33%
- Both Plug & Muff: 15%
- EHPDs: 2%
- Plugs or Muffs: 3%
No youths reported poor hearing

Most subjects reported Perfect or Very Good hearing
Results: Tinnitus

Incidence of Constant Tinnitus

Temporary tinnitus or increase in constant tinnitus after shooting?

<table>
<thead>
<tr>
<th>% of Respondents</th>
<th>No</th>
<th>Yes</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIDATA</td>
<td>94%</td>
<td>15%</td>
</tr>
<tr>
<td>CODATA</td>
<td>85%</td>
<td>85%</td>
</tr>
<tr>
<td>Total Data</td>
<td>90%</td>
<td>10%</td>
</tr>
</tbody>
</table>
MI / CO Data are similar; however, some notable differences:

- Michigan youths reported hunting large game out of an enclosed blind more often than Colorado youths—Increased risk for NIHL

- Colorado youths were more likely to use a handgun (reminisce of the wild west?)—Increased risk of NIHL

- Michigan youths reported less consistent use of HPDs during target practice and hunting (71% to 45% for hunting) and were less concerned about NIHL from firearm noise—Increased risk of NIHL
Youths are putting themselves at risk for NIHL due to shooting habits and inconsistent use of HPDs while shooting firearms.

Most are using large bore firearms capable of rapid fire, especially for hunting when HPDs are less likely to be used.

10% incidence rate of constant tinnitus
- 10-15% general adult population (ASHA, 2010)
- 22% adult RFUs population (Stewart et al. 2011)

Additionally, 45% reported tinnitus or an increase in their constant tinnitus after shooting firearms.

Many report good or excellent hearing,- their case histories and the incidence of tinnitus suggest it may not stay that way long.
We need to improve firearm noise hearing conservation for youths involved in the shooting sports.

**Educational training should focus on:**
- The hazardous effects of firearm noise on hearing
- Hearing protection

**The proper type of HPDs should be stressed as a major component of the program**

**Demonstrations of simulated hearing loss (NIOSH, 2011) and simulated tinnitus (Martin, 2009) could be used for youths to hear the consequences of excessive firearm noise exposure**
Recommendations

- Educational programs could be offered through:
  - Hunter safety courses
  - 4-H
  - Boy Scouts/Girl Scouts
  - Shooting teams
  - Hunting clubs

- Educate patients and family members about the hazards of firearm noise-use resources

- Provide conservation classes to school-aged children

- Probe case history items of patients regarding firearm use and make appropriate recommendations to prevent NIHL
Questions?
References


References


